

# MSCI Index Calculation Methodologies

*Index Calculation Methodology for the MSCI Equity Indices, as well as alternative index calculations, such as MSCI's GDP Indices and Daily Total Return (DTR) Indices.*

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## Introduction

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This methodology book describes MSCI's general Index calculation methodology for the MSCI Equity Indices, as well as alternative index calculations such as MSCI's GDP Weighted Indices and Daily Total Return (DTR) Indices.

These policies and guidelines affect all securities across the MSCI Equity Indices and products. Unless otherwise stated the policies and guidelines apply therefore to all securities in the MSCI Equity universe.

Please note that the index construction methodology and other guiding principles for the MSCI Standard Indices can be found in MSCI Global Investable Market Indices Methodology Indices document, available at [www.msci Barra.com](http://www.msci Barra.com).

### MSCI Equity Indices

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The MSCI Equity Indices measure the performance of a set of equity securities over time. The MSCI Equity Indices are calculated using the Laspeyres' concept of a weighted arithmetic average together with the concept of chain-linking.

MSCI country and regional equity Indices are calculated in “local currency” as well as in USD, with price, gross and net returns.

Index levels are also available in several other currencies such as AUD, BRL, CAD, CHF, CNY, EUR, GBP, HKD, INR, JPY, RUB and SGD.

While the local currency series of regional indices cannot be replicated in the real world, it represents the theoretical performance of an index without any impact from foreign exchange fluctuations — a continuously hedged portfolio.

Indices are calculated 5 days a week, from Monday to Friday with the exception of a selection of indices that have Saturday and Sunday calculations available.

In certain cases, where there are no qualifying securities, it is possible for MSCI Indices to be empty following a security deletion or GICS change. If an index becomes empty it would be dynamically discontinued or ‘ruptured’. It is then possible for the index to be re-started once a new security qualifies for the index, and this index level would be rebased to an appropriate level at that time.

## Section 1: MSCI Price Index Methodology

Price indices measure the market prices performance for a selection of securities. They are calculated daily and, for some of them, on a real time basis. Each index captures the market capitalization weighted return of all constituents included in the index.

### 1.1 Price Index Level

As a general principle, today's index level is obtained by applying the change in the market performance to the previous period index level.

$$PriceIndexLevelUSD_t = PriceIndexLevelUSD_{t-1} * \frac{IndexAdjustedMarketCapUSD_t}{IndexInitialMarketCapUSD_t}$$

$$PriceIndexLevelLocal_t = PriceIndexLevelLocal_{t-1} * \frac{IndexAdjustedMarketCapForLocal_t}{IndexInitialMarketCapUSD_t}$$

Where:

- $PriceIndexLevelUSD_{t-1}$  is the Price Index level in USD at time t-1
- $IndexAdjustedMarketCapUSD_t$  is the Adjusted Market Capitalization of the index in USD at time t
- $IndexInitialMarketCapUSD_t$  is the Initial Market Capitalization of the index in USD at time t
- $PriceIndexLevelLocal_{t-1}$  is the Price Index level in local currency at time t-1
- $IndexAdjustedMarketCapForLocal_t$  is the Adjusted Market Capitalization of the index in USD converted using FX rate as of t-1 and used for local currency index at time t

Note:  $IndexInitialMarketCapUSD$  was previously called  $IndexUnadjustedMarketCapPreviousUSD$

#### 1.1.1 Index Market Capitalization

$$IndexAdjustedMarketCapUSD_t = \sum_{s \in I, t} \frac{IndexNumberOfShares_{s,t-1} * PricePerShare_t * InclusionFactor_t * PAF_t}{FXrate_t}$$

*IndexAdjustedMarketCapForLocal* =

$$\sum_{s \in I, t} \left( \frac{\text{IndexNumberOfShares}_{s,t-1} * \text{PricePerShare}_t * \text{InclusionFactor}_t * \text{PAF}_t * \frac{\text{ICI}_t}{\text{ICI}_{t-1}}}{\text{FXrate}_{t-1}} \right)$$

*IndexInitialMarketCapUSD* =

$$\sum_{s \in I, t} \frac{\text{IndexNumberOfShares}_{s,t-1} * \text{PricePerShare}_{t-1} * \text{InclusionFactor}_t}{\text{FXrate}_{t-1}}$$

Where:

- *IndexNumberOfShares<sub>s,t-1</sub>* is the number of shares of security s at time t-1.
- *PricePerShare<sub>t</sub>* is the price per share of the security s at time t.
- *PricePerShare<sub>t-1</sub>* is the price per share of security s at time t-1.
- *InclusionFactor<sub>t</sub>* is the inclusion factor of the security s at time t. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- *PAF<sub>t</sub>* is the Price Adjustment Factor of the security s at time t.
- *FXrate<sub>t</sub>* is the FX rate of the price currency of security s vs USD at time t. It is the value of 1 USD in foreign currency.
- *FXrate<sub>t-1</sub>* is the FX rate of the price currency of security s vs USD at time t-1. It is the value of 1 USD in foreign currency.
- *ICI<sub>t</sub>* is the Internal Currency Index of price currency at time t. The ICI is different than 1 when a country changes the internal value of its currency (e.g. from Turkish Lira to New Turkish Lira – ICI = 1,000,000).
- *ICI<sub>t-1</sub>* is the Internal Currency Index of price currency at time t-1.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The ‘Standard Index Inclusion Factor’ is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The ‘Small Cap Index Inclusion Factor’ is not used for the computation of the MSCI Emerging

Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

**Note:**

The only difference in the formulas between USD and local currency indices calculation is that the same exchange rate is used in the numerator and denominator for local currency, which means that there is no impact of currency change in the performance. Time variant exchange rates are used for the USD calculation.



## 1.1.2 Example of calculation

### Day 1

	NumberOf Shares t-1	PricePer Share t	PricePer Share t-1	Inclusion Factor t	PAF t	FXrate t	FXrate t-1	IndexAdjustedM arketCapUSD t (see 1.1.1)	IndexInitialMar ketCapUSD t (see 1.1.1)	IndexAdjusted MarketCapFor Local t (see 1.1.1)
Security A	150000	152.60	154.00	0.75	1	1.50	1.49	11,445,000	11,627,517	11,521,812
Security B	26000	98.40	105.00	1.00	1	1.15	1.14	2,224,696	2,394,737	2,244,211
Security C	290000	1592.60	1603.50	0.60	1	125.00	125.50	2,216,899	2,223,179	2,208,067
Security D	360000	268.00	265.30	0.85	1	1.50	1.50	54,672,000	54,121,200	54,672,000
Total Index								70,558,595	70,366,633	70,646,090
		t	t-1	daily perf						
PriceIndexLevelUSD (see 1.1)		100.273	100.000	0.27%						
PriceIndexLevelLocal (see 1.1)		100.397	100.000	0.40%						

### Day 2

Security C is ex Right issue 1 : 1 @ 1300

	NumberOf Shares t-1	PricePer Share t	PricePer Share t-1	Inclusion Factor t	PAF t	FXrate t	FXrate t-1	IndexAdjustedM arketCapUSD t (see 1.1.1)	IndexInitialMar ketCapUSD t (see 1.1.1)	IndexAdjusted MarketCapFor Local t (see 1.1.1)
Security A	150000	160.00	152.60	0.75	1	1.51	1.50	11,920,530	11,445,000	12,000,000
Security B	26000	95.00	98.40	1.00	1	1.16	1.15	2,129,310	2,224,696	2,147,826
Security C	290000	1450.00	1592.60	0.60	1.1012	124.50	125.00	2,231,497	2,216,899	2,222,571
Security D	360000	265.00	268.00	0.85	1	1.51	1.50	53,701,987	54,672,000	54,060,000
Total Index								69,983,323	70,558,595	70,430,397
		t	t-1	daily perf						
PriceIndexLevelUSD (see 1.1)		99.455	100.273	-0.82%						
PriceIndexLevelLocal (see 1.1)		100.215	100.397	-0.18%						

### Day 3

Security C has an increase of number of shares following the right issue ex on Day 2

	NumberOf Shares t-1	PricePer Share t	PricePer Share t-1	Inclusion Factor t	PAF t	FXrate t	FXrate t-1	IndexAdjustedM arketCapUSD t (see 1.1.1)	IndexInitialMar ketCapUSD t (see 1.1.1)	IndexAdjusted MarketCapFor Local t (see 1.1.1)
Security A	150000	165.00	160.00	0.75	1	1.50	1.51	12,375,000	11,920,530	12,293,046
Security B	26000	102.00	95.00	1.00	1	1.17	1.16	2,266,667	2,129,310	2,286,207
Security C	580000	1545.00	1450.00	0.60	1	124.45	124.50	4,320,289	4,053,012	4,318,554
Security D	360000	266.00	265.00	0.85	1	1.50	1.51	54,264,000	53,701,987	53,904,636
Total Index								73,225,956	71,804,839	72,802,443
		t	t-1	daily perf						
PriceIndexLevelUSD (see 1.1)		101.424	99.455	1.98%						
PriceIndexLevelLocal (see 1.1)		101.607	100.215	1.39%						

## 1.2 Price Index Level (Alternative Calculation Formula – Contribution Method)

Another way to calculate the index level would be to use the initial weight and price return of the individual securities included in the index:

$$PriceIndexLevelUSD_t = PriceIndexLevelUSD_{t-1} * (1 + \sum_{s \in I, t} SecurityPriceContributionToIndexUSD_t)$$

$$PriceIndexLevelLocal_t = PriceIndexLevelLocal_{t-1} * (1 + \sum_{s \in I, t} SecurityPriceContributionToIndexLocal_t)$$

### 1.2.1 Security Contribution to the Index

$$SecurityPriceContributionToIndexUSD_t = InitialSecurityWeight_s * SecurityDailyPriceReturnUSD_t$$

$$SecurityPriceContributionToIndexLocal_t = InitialSecurityWeight_s * SecurityDailyPriceReturnLocal_t$$

Where:

- *SecurityDailyPriceReturnUSD<sub>t</sub>* is the price return in USD of security s at time t.
- *SecurityDailyPriceReturnLocal<sub>t</sub>* is the price return of security s at time t converted using FX rate as of t-1 and used for local currency calculation at time t.

## 1.2.2 Today's Initial Security Weight

*InitialSecurityWeight<sub>t</sub>* =

$$\frac{\frac{IndexNumberOfShares_{t-1} * PricePerShare_{t-1} * InclusionFactor_t}{FXrate_{t-1}}}{\sum_{s \in I_t} \left( \frac{IndexNumberOfShares_{t-1} * PricePerShare_{t-1} * InclusionFactor_t}{FXrate_{t-1}} \right)} * 100 =$$

$$\frac{SecurityInitialFullMarketCapUSD_t * InclusionFactor_t}{\sum_{s \in I_t} (SecurityInitialFullMarketCapUSD_t * InclusionFactor_t)} * 100 =$$

$$\frac{SecurityInitialMarketCapUSD_t}{IndexInitialMarketCapUSD_t} * 100$$

Where:

- *IndexNumberOfShares<sub>t-1</sub>* is the number of shares of security s at time t-1.
- *PricePerShare<sub>t-1</sub>* is the price per share of security s at time t-1.
- *InclusionFactor<sub>t</sub>* is the inclusion factor of security s at time t. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- *FXrate<sub>t-1</sub>* is the FX rate of the price currency of security s vs USD at time t-1. It is the value of 1 USD in foreign currency.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM Countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The 'Standard Index Inclusion Factor' is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The ‘Small Cap Index Inclusion Factor’ is not used for the computation of the MSCI Emerging Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

Note: The *SecurityInitialFullMarketCapInSecurityPriceCurrency<sub>t</sub>* is also available in the security files and corresponds to the *SecurityInitialFullMarketCapUSD<sub>t</sub>* multiplied by the *FXrate<sub>t-1</sub>*

The *IndexNumberOfShares<sub>t-1</sub>* used to calculate today’s initial weight, available in the MSCI products dated day *t*, is shown as “Number of Shares (Today Index)”.

## 1.2.3 Security Daily Price Return

$$SecurityDailyPriceReturnUSD_t = \left[ \frac{SecurityAdjustedMarketCapUSD_t}{SecurityInitialMarketCapUSD_t} - 1 \right] * 100$$

$$SecurityDailyPriceReturnLocal_t = \left[ \frac{SecurityAdjustedMarketCapForLocal_t}{SecurityInitialMarketCapUSD_t} - 1 \right] * 100$$

$$SecurityAdjustedMarketCapForLocal_t = \frac{IndexNumberOfShares_{t-1} * PricePerShare_t * InclusionFactor_t * PAF_t * \frac{ICI_t}{FXrate_{t-1}}}{ICI_{t-1}}$$

$$SecurityAdjustedMarketCapUSD_t = \frac{IndexNumberOfShares_{t-1} * PricePerShare_t * InclusionFactor_t * PAF_t}{FXrate_t}$$

$$SecurityInitialMarketCapUSD_t = \frac{IndexNumberOfShares_{t-1} * PricePerShare_{t-1} * InclusionFactor_t}{FXrate_{t-1}}$$

Where:

- *SecurityAdjustedMarketCapForLocal<sub>t</sub>* is the Adjusted Market Capitalization of security *s* in USD converted using FX rate as of *t-1*

- *SecurityAdjustedMarketCapUSD<sub>t</sub>* is the Adjusted Market Capitalization of security *s* in USD converted using FX rate as of *t*
- *SecurityInitialMarketCapUSD<sub>t</sub>* is the Initial Market Capitalization of security *s* in USD at time *t*
- *IndexNumberOfShares<sub>t-1</sub>* is the number of shares of security *s* at time *t-1*.
- *PricePerShare<sub>t</sub>* is the price per share of security *s* at time *t*.
- *PricePerShare<sub>t-1</sub>* is the price per share of security *s* at time *t-1*.
- *InclusionFactor<sub>t</sub>* is the inclusion factor of security *s* at time *t*. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- *PAF<sub>t</sub>* is the Price Adjustment Factor of security *s* at time *t*.
- *FXrate<sub>t</sub>* is the FX rate of the price currency of security *s* vs USD at time *t*. It is the value of 1 USD in foreign currency.
- *FXrate<sub>t-1</sub>* is the FX rate of the price currency of security *s* vs USD at time *t-1*. It is the value of 1 USD in foreign currency.
- *ICI<sub>t</sub>* is the Internal Currency Index of price currency at time *t*. The ICI is different than 1 when a country changes the internal value of its currency (e.g. from Turkish Lira to New Turkish Lira – ICI = 1,000,000).
- *ICI<sub>t-1</sub>* is the Internal Currency Index of price currency at time *t-1*.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM Countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The ‘Standard Index Inclusion Factor’ is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The ‘Small Cap Index Inclusion Factor’ is not used for the computation of the MSCI Emerging Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

### 1.2.4 Example of calculation using contribution

## Day 1

	NumberOf Shares t-1	PricePer Share t	PricePer Share t-1	Inclusion Factor t	PAF t	FXrate t	FXrate t-1	InitialSecurityWeight t (see 1.2.2)	SecurityDaily Price_Return USD t (see 1.2.3)	SecurityPricec ontributionToIn dexUSD (see 1.2.1)	SecurityDaily Price_Return Local t (see 1.2.3)	SecurityPricec ontributionToIn dexLocal (see 1.2.1)
Security A	150000	152.60	154.00	0.75	1	1.50	1.49	16.52%	-1.57%	-0.26%	-0.91%	-0.15%
Security B	26000	98.40	105.00	1.00	1	1.15	1.14	3.40%	-7.10%	-0.24%	-6.29%	-0.21%
Security C	290000	1592.60	1603.50	0.60	1	125.00	125.50	3.16%	-0.28%	-0.01%	-0.68%	-0.02%
Security D	360000	268.00	265.30	0.85	1	1.50	1.50	76.91%	1.02%	0.78%	1.02%	0.78%
Total Index								100.00%		0.27%		0.40%
		t	t-1	daily perf								
PriceIndexLevelUSD (see 1.2)		100.273	100.000	0.27%								
PriceIndexLevelLocal (see 1.2)		100.397	100.000	0.40%								

## Day 2

Security C is ex Right issue 1 : 1 @ 1300

	NumberOf Shares t-1	PricePer Share t	PricePer Share t-1	Inclusion Factor t	PAF t	FXrate t	FXrate t-1	InitialSecurit yWeight t (see 1.2.2)	SecurityDaily Price_Return USD t (see 1.2.3)	SecurityPriceC ontributionToIn dexUSD (see 1.2.1)	SecurityDaily Price_Return Local t (see 1.2.3)	SecurityPriceC ontributionToIn dexLocal (see 1.2.1)
Security A	150000	160.00	152.60	0.75	1	1.51	1.50	16.22%	4.15%	0.67%	4.85%	0.79%
Security B	26000	95.00	98.40	1.00	1	1.16	1.15	3.15%	-4.29%	-0.14%	-3.46%	-0.11%
Security C	290000	1450.00	1592.60	0.60	1.1012	124.50	125.00	3.14%	0.66%	0.02%	0.26%	0.01%
Security D	360000	265.00	268.00	0.85	1	1.51	1.50	77.48%	-1.77%	-1.37%	-1.12%	-0.87%
Total Index								100.00%		-0.82%		-0.18%
		t	t-1	daily perf								
PriceIndexLevelUSD (see 1.2)		99.455	100.273	-0.82%								
PriceIndexLevelLocal (see 1.2)		100.215	100.397	-0.18%								

### Day 3

Security C has an increase of number of shares following the right issue ex on Day 2

	NumberOf Shares t-1	PricePer Share t	PricePer Share t-1	Inclusion Factor t	PAF t	FXrate t	FXrate t-1	InitialSecurit yWeight t (see 1.2.2)	SecurityDaily Price_Return USD t (see 1.2.3)	SecurityPriceC ontributionToIn dexUSD (see 1.2.1)	SecurityDaily Price_Return Local t (see 1.2.3)	SecurityPriceC ontributionToIn dexLocal (see 1.2.1)
Security A	150000	165.00	160.00	0.75	1	1.50	1.51	16.60%	3.81%	0.63%	3.13%	0.52%
Security B	26000	102.00	95.00	1.00	1	1.17	1.16	2.97%	6.45%	0.19%	7.37%	0.22%
Security C	580000	1545.00	1450.00	0.60	1	124.45	124.50	5.64%	6.59%	0.37%	6.55%	0.37%
Security D	360000	266.00	265.00	0.85	1	1.50	1.51	74.79%	1.05%	0.78%	0.38%	0.28%
Total Index								100.00%		1.98%		1.39%
		t	t-1	daily perf								
PriceIndexLevelUSD (see 1.2)		101.424	99.455	1.98%								
PriceIndexLevelLocal (see 1.2)		101.607	100.215	1.39%								

## 1.3 Next Day Initial Security Weight

*InitialSecurityWeight*<sub>t+1</sub> =

$$\frac{\frac{IndexNumberOfShares_s * PricePerShare_t * InclusionFactor_{t+1}}{FXrate_t}}{\sum_{s \in I_{t+1}} \left( \frac{IndexNumberOfShares_s * PricePerShare_t * InclusionFactor_{t+1}}{FXrate_t} \right)} * 100 =$$

$$\frac{SecurityInitialFullMarketCapUSD_{t+1} * InclusionFactor_{t+1}}{\sum_{s \in I_{t+1}} (SecurityInitialFullMarketCapUSD_{t+1} * InclusionFactor_{t+1})} * 100 =$$

$$\frac{SecurityInitialMarketCapUSD_{t+1}}{IndexInitialMarketCapUSD_{t+1}} * 100$$

Where:

- *IndexNumberOfShares<sub>s</sub>* is the number of shares of security s at time t.
- *PricePerShare<sub>t</sub>* is the price per share of the security s at time t.
- *InclusionFactor<sub>t+1</sub>* is the inclusion factor of the security s at time t+1. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- *FXrate<sub>t</sub>* is the FX rate of the price currency of security s vs USD at time t. It is the value of 1 USD in foreign currency.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM Countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The 'Standard Index Inclusion Factor' is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The 'Small Cap Index Inclusion Factor' is not used for the computation of the MSCI Emerging

Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The list of index constituents as of time  $t+1$  is considered in the calculation.

Notes:

The *SecurityInitialFullMarketCapInSecurityPriceCurrency* <sub>$t+1$</sub>  is also available in the security files and corresponds to the *SecurityInitialFullMarketCapUSD* <sub>$t+1$</sub>  multiplied by the *FXrate* <sub>$t$</sub>

The *IndexNumberOfShares* <sub>$t$</sub>  used to calculate next day's initial weight, available in the MSCI products dated day  $t$ , is shown as "Number of Shares (Next Day Index)".

## 1.4 Closing Index Market Capitalization today USD (Unadjusted Market Cap today USD)

The value of the index market capitalization as of the close of a day is calculated as follows:

$$IndexClosingMarketCapUSD_t = \sum_{s \in I_t} \frac{ClosingNumberOfShares_s_t * PricePerShare_s_t * InclusionFactor_s_t}{FXrate_t}$$

Where

- *ClosingNumberOfShares* <sub>$s_t$</sub>  is the number of shares of security  $s$  at the close of  $t$ .
- *PricePerShare* <sub>$s_t$</sub>  is the security price per share of security  $s$  at time  $t$ .
- *InclusionFactor* <sub>$s_t$</sub>  is the inclusion factor of the security  $s$  at time  $t$ . The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- *FXrate* <sub>$t$</sub>  is the FX rate of the price currency of security  $s$  vs USD at time  $t$ . It is the value of 1 USD in foreign currency.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM Countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets



capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The 'Standard Index Inclusion Factor' is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The 'Small Cap Index Inclusion Factor' is not used for the computation of the MSCI Emerging Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The list of index constituents as of time  $t$  should be considered in the calculation.

Effectively this figure represents the shares at the close on  $t$ , and does not include any of the effects of corporate actions due at the open of the market the next day.

The closing market capitalization uses today's price,  $t$ , as it represents the market capitalization at the close of the calculation day  $t$ .

## 1.5 Security Index of Price in Local

The security Index of Price is distributed in MSCI daily and monthly security products [It represents the price return from period to period by utilizing the concept of an index of performance with an arbitrary base value. The index of price is fully adjusted for capital changes and is expressed in local currency.

$$SecurityPriceIndexLocal_t = SecurityPriceIndexLocal_{t-1} * \frac{SecurityAdjustedMarketCapForLocal_t}{SecurityInitialMarketCapUSD_t}$$

$$SecurityAdjustedMarketCapForLocal_t = \frac{IndexNumberOfShares_{t-1} * PricePerShare_t * InclusionFactor_t * PAF_t}{FXrate_{t-1}} * \frac{ICI_t}{ICI_{t-1}}$$

$$SecurityInitialMarketCapUSD_t = \frac{IndexNumberOfShares_{t-1} * PricePerShare_{t-1} * InclusionFactor_t}{FXrate_{t-1}}$$

Where:

- $SecurityPriceIndexLevel_{t-1}$  is Security Price Index level at time t-1
- $SecurityAdjustedMarketCapForLocal_t$  is the Adjusted Market Capitalization of security s in USD converted using FX rate as of t-1
- $SecurityInitialMarketCapUSD_t$  is the Initial Market Capitalization of security s in USD at time t
- $IndexNumberOfShares_{t-1}$  is the number of shares of security s at time t-1.
- $PricePerShare_t$  is the price per share of security s at time t.
- $PricePerShare_{t-1}$  is the price per share of security s at time t-1.
- $InclusionFactor_t$  is the inclusion factor of security s at time t. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- $PAF_t$  is the Price Adjustment Factor of security s at time t.
- $FXrate_{t-1}$  is the FX rate of the price currency of security s vs USD at time t-1. It is the value of 1 USD in foreign currency.
- $ICI_t$  is the Internal Currency Index of price currency at time t. The ICI is different than 1 when a country changes the internal value of its currency (e.g. from Turkish Lira to New Turkish Lira – ICI = 1,000,000).
- $ICI_{t-1}$  is the Internal Currency Index of price currency at time t-1.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM Countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The ‘Standard Index Inclusion Factor’ is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The ‘Small Cap Index Inclusion Factor’ is not used for the computation of the MSCI Emerging Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

## 1.6 Note on Index Calculation in Local Currency

The MSCI Country and Regional Indices are calculated in local currency as well as in USD. The concept of a “local currency” calculation excludes the impact of currency fluctuations.

Note that for a country index, the local currency index will not be the same as an index calculated with the official currency of that country, if there is more than one currency of listing.

All currencies of listing are considered in the index calculation in local currency where current prices<sub>t</sub> and previous day prices<sub>t-1</sub> are converted into USD using the same exchange rate (exchange rate<sub>t-1</sub>) in the numerator and denominator. As a consequence, the FX factor drops out of the equation.

The USD calculation includes exchange rates at t and t-1. Therefore, the local currency calculation only represents the price appreciation or depreciation of the securities, whereas the USD calculation also accounts for the performance of the currency (or currencies) relative to the USD.

## 1.7 Conversion of indices into another currency

An index can be calculated into any currency by converting the index in USD into the selected currency using the formula below.

- If the base date of the index is prior to the start date of the currency, the indices should be rebased and converted using the following formula:

$$IndexLevelnCurrency = 100 * \frac{IndexLevelnUSD_t}{IndexLevelnUSD_{currency\_base\_date}} * \frac{FXrate_t}{FXrate_{currency\_base\_date}}$$

Note that 100 in the formula is the base value. This base value can be different than 100 (e.g. 1000 depending on the indices).

- If the base date of the index is equal or posterior to the start date of the currency, the indices should be converted only, using the following formula:

$$IndexLevelnCurrency = IndexLevelnUSD_t * \frac{FXrate_t}{FXrate_{index\_base\_date}}$$

Example:

Calculation of the The World Index in EUR as of October 20, 1999:  
Note that the start date of EUR is 31-Dec-1998

- The World Index in USD as of 31-Dec-98 = 1,149.951577
- The World Index as of 20-Oct-99 = 1,224.048387
- FxRate EUR vs USD as of 31-Dec-98 = 0.8516074
- FxRate EUR vs USD as of 20-Oct-99 = 0.9279451

$$WorldIndexinEUR_{10/20/99} = 100 * \frac{WorldIndexinUSD_{10/20/99} * EURvsUSDRate_{10/20/99}}{WorldIndexinUSD_{31/12/98} * EURvsUSDRate_{12/31/98}} =$$

$$100 * \frac{1224.048387}{1149.951577} * \frac{0.9279451}{0.8516074} = 115.985$$

## Section 2: MSCI Daily Total Return (DTR) Index Methodology

Total return indices measure the market performance, including price performance and income from dividend payments. A dividend is a distribution of cash (or securities) made by a company to its shareholders.

The funds are taken from annual operating profits (regular dividend), from capital and/or reserves, or from extraordinary earnings. This income is reinvested in the index and thus makes up part of the total index performance.

MSCI's Daily Total Return (DTR) methodology reinvests cash dividends in indices the day the security is quoted ex-dividend (ex-date). It applies to all index families. Cash dividends are not considered in price indices, except for special dividends in certain circumstances described below.

The standard Daily Total Return (DTR) Indices are calculated and distributed on a daily basis. The indices are available in USD and local currency (no currency impact), with gross and net total return

### 2.1 Calculation Methodology

$$DTRIndexLevelUSD_t = DTRIndexLevelUSD_{t-1} * \frac{(IndexAdjustedMarketCapUSD_t + IndexDividendImpactUSD_t)}{IndexInitialMarketCapUSD_t}$$

$$DTRIndexLevelLocal_t = DTRIndexLevelLocal_{t-1} * \frac{(IndexAdjustedMarketCapForLocal_t + IndexDividendImpactForLocal_t)}{IndexInitialMarketCapUSD_t}$$

Where:

- $DTRIndexLevelUSD_{t-1}$  is the Daily Total Return index level in USD at time t-1
  - $IndexDividendImpactUSD_t$  is the gross or net amount of dividends in USD to be reinvested in the index in USD at time t
  - $IndexDividendImpactForLocal_t$  is the gross or net amount of dividend in USD converted using FX rate as of t-1 to be reinvested in the local currency index at time t
- $DTRIndexLevelLocal_{t-1}$  the Daily Total Return index level in local currency at time t-1

### 2.1.1 Dividend Impact

$$IndexDividendImpactUSD_t =$$

$$\sum_{s \in I_t} \frac{IndexNumberOfShares_{ex-date-1} * DividendPerShare_t * InclusionFactor_t}{FXrate_t}$$

$$IndexDividendImpactForLocal_t =$$

$$\sum_{s \in I_t} \left( \frac{IndexNumberOfShares_{ex-date-1} * DividendPerShare_t * InclusionFactor_t}{FXrate_{t-1}} * \frac{ICI_t}{ICI_{t-1}} \right)$$

Where:

- $IndexNumberOfShares_{ex-date-1}$  is the number of shares of the security  $s$  at the dividend ex-date-1.
- $DividendPerShare_t$  is the gross or net dividend per share expressed in the same currency unit as the price per share of the security  $s$  to be reinvested at time  $t$ .

### 2.1.2 DTR Index Level from Security Information (Security DTR)

Another way to calculate a DTR index would be to use the security initial weight and security total return:

$$DTRIndexLevelUSD_t = DTRIndexLevelUSD_{t-1} * (1 + \sum_{s \in I_t} SecurityTotalReturnContributionToIndexUSD_t)$$

$$DTRIndexLevelLocal_t = DTRIndexLevelLocal_{t-1} * (1 + \sum_{s \in I_t} SecurityTotalReturnContributionToIndexLocal_t)$$

### 2.1.3 Security Contribution to the Index

Calculation Formulas:

$$SecurityTotalReturnContributionToIndexUSD_t =$$

$$InitialSecurityWeight_t * SecurityDailyTotalReturnUSD_t$$

$$SecurityTotalReturnContributionToIndexLocal_t = InitialSecurityWeight_t * SecurityDailyTotalReturnLocal_t$$

Where:

- *SecurityDailyTotalReturnUSD<sub>t</sub>* is the gross or net return in USD of security s at time t.
- *SecurityDailyTotalReturnLocal<sub>t</sub>* is the gross or net return of security s at time t converted using the FX rate as of t-1 and used for local currency calculation at time t.

## 2.1.4 Security Daily Total Return

### 2.1.4.1 Security Daily Gross Return

$$SecurityDailyGrossReturnUSD_t = \left[ \frac{(SecurityAdjustedMarketCapUSD_t + SecurityGrossDividendImpactUSD_t)}{SecurityInitialMarketCapUSD_t} - 1 \right] * 100$$

$$SecurityDailyGrossReturnLocal_t = \left[ \frac{(SecurityAdjustedMarketCapForLocal_t + SecurityGrossDividendImpactForLocal_t)}{SecurityInitialMarketCapUSD_t} - 1 \right] * 100$$

Where

$$SecurityGrossDividendImpactUSD_t = \frac{IndexNumberOfShares_{ex-date-1} * GrossDividendPerShare_t * InclusionFactor_t}{FXrate_t}$$

$$SecurityGrossDividendImpactForLocal_t = \frac{IndexNumberOfShares_{ex-date-1} * GrossDividendPerShare_t * InclusionFactor_t}{FXrate_{t-1}} * \frac{ICI_t}{ICI_{t-1}}$$

Where

- *SecurityAdjustedMarketCapForLocal<sub>t</sub>* is the Adjusted Market Capitalization of security s in USD converted using FX rate as of t-1
- *SecurityAdjustedMarketCapUSD<sub>t</sub>* is the Adjusted Market Capitalization of security s in USD converted using FX rate as of t
- *SecurityInitialMarketCapUSD<sub>t</sub>* is the Initial Market Capitalization of security s in USD at time t

- *InclusionFactor<sub>t</sub>* is the inclusion factor of the security *s* at time *t*. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- *FXrate<sub>t</sub>* is the FX rate of the price currency of security *s* vs USD at time *t*. It is the value of 1 USD in foreign currency.
- *FXrate<sub>t-1</sub>* is the FX rate of the price currency of security *s* vs USD at time *t-1*. It is the value of 1 USD in foreign currency.
- *IndexNumberOfShares<sub>ex-date-1</sub>* is the number of shares of security *s* at the dividend ex-date-1.
- *GrossDividendPerShare<sub>t</sub>* is the gross dividend per share expressed in the same currency unit as the price per share of the security *s* to be reinvested at time *t*.
- *ICI<sub>t</sub>* is the Internal Currency Index of price currency at time *t*. The ICI is different than 1 when a country changes the internal value of its currency (e.g. from Turkish Lira to New Turkish Lira – ICI = 1,000,000).
- *ICI<sub>t-1</sub>* is the Internal Currency Index of price currency at time *t-1*.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM Countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The ‘Standard Index Inclusion Factor’ is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The ‘Small Cap Index Inclusion Factor’ is not used for the computation of the MSCI Emerging Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

## 2.1.4.2 Security Daily Net Return

*SecurityDailyNetReturnUSD<sub>t</sub>* =

$$\left[ \frac{(SecurityAdjustedMarketCapUSD_t + SecurityNetDividendImpactUSD_t)}{SecurityInitialMarketCapUSD_t} - 1 \right] * 100$$



$$SecurityDailyNetReturnLocal_t = \left[ \frac{(SecurityAdjustedMarketCapForLocal_t + SecurityNetDividendImpactForLocal_t)}{SecurityInitialMarketCapUSD_t} - 1 \right] * 100$$

Where

$$SecurityNetDividendImpactUSD_t = \frac{IndexNumberOfShares_{ex-date-1} * NetDividendPerShare_t * InclusionFactor_t}{FXrate_t}$$

$$SecurityNetDividendImpactForLocal_t = \frac{IndexNumberOfShares_{ex-date-1} * NetDividendPerShare_t * InclusionFactor_t}{FXrate_{t-1}} * \frac{ICI_t}{ICI_{t-1}}$$

Where

- *SecurityAdjustedMarketCapForLocal<sub>t</sub>* is the Adjusted Market Capitalization of security s in USD converted using FX rate as of t-1
- *SecurityAdjustedMarketCapUSD<sub>t</sub>* is the Adjusted Market Capitalization of security s in USD converted using FX rate as of t
- *SecurityInitialMarketCapUSD<sub>t</sub>* is the Initial Market Capitalization of security s in USD at time t
- *InclusionFactor<sub>t</sub>* is the inclusion factor of the security s at time t. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- *FXrate<sub>t</sub>* is the FX rate of the price currency of security s vs USD at time t. It is the value of 1 USD in foreign currency.
- *FXrate<sub>t-1</sub>* is the FX rate of the price currency of security s vs USD at time t-1. It is the value of 1 USD in foreign currency.
- *IndexNumberOfShares<sub>ex-date-1</sub>* is the number of shares of the security s at the dividend ex-date-1.
- *NetDividendPerShare<sub>t</sub>* is the net dividend per share expressed in the same currency unit as the price per share of the security s to be reinvested at time t.

- $ICI_t$  is the Internal Currency Index of price currency at time t. The ICI is different than 1 when a country changes the internal value of its currency (e.g. from Turkish Lira to New Turkish Lira – ICI = 1,000,000).
- $ICI_{t-1}$  is the Internal Currency Index of price currency at time t-1.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM Countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The ‘Standard Index Inclusion Factor’ is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The ‘Small Cap Index Inclusion Factor’ is not used for the computation of the MSCI Emerging Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

## 2.1.5 Initial Security Weight

$InitialSecurityWeight_t =$

$$\frac{IndexNumberOfShares_{t-1} * PricePerShare_{t-1} * InclusionFactor_t}{FXrate_{t-1}} * 100 = \sum_{s \in I_t} \left( \frac{IndexNumberOfShares_{t-1} * PricePerShare_{t-1} * InclusionFactor_t}{FXrate_{t-1}} \right)$$

$$\frac{SecurityInitialFullMarketCapUSD_t * InclusionFactor_t}{\sum_{s \in I_t} (SecurityInitialFullMarketCapUSD_t * InclusionFactor_t)} * 100 =$$

$$\frac{SecurityInitialMarketCapUSD_t}{IndexInitialMarketCapUSD_t} * 100$$

Where:

- *IndexNumberOfShares<sub>t-1</sub>* is the number of shares of security s at time t-1.
- *PricePerShare<sub>t-1</sub>* is the price per share of security s at time t-1.
- *InclusionFactor<sub>t</sub>* is the inclusion factor of security s at time t. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).
- *FXrate<sub>t-1</sub>* is the FX rate of the price currency of security s vs USD at time t-1. It is the value of 1 USD in foreign currency.

(\*) From June 1 2007 to May 31 2008, to calculate the standard or small cap index market capitalization (except for FM countries and China A), the security market cap should be multiplied by the Standard or Small Cap Index Inclusion Factor.

From September 1 2009 to November 30 2009, to calculate the China A and related indices markets capitalization, the China A securities market cap should be multiplied by the Standard Index Inclusion Factor.

The 'Standard Index Inclusion Factor' is solely used for the computation of the MSCI Standard Indices, and not for the Large Cap, Mid Cap and Provisional Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

The 'Small Cap Index Inclusion Factor' is not used for the computation of the MSCI Emerging Markets and AC Small Cap Indices, MSCI Small Cap Value and Growth, MSCI Provisional Small Cap and MSCI Small Cap Sectors Indices, as these are all constructed using the Global Investable Market Indices methodology and were not subject to the transition methodology.

## 2.1.6 Currency

For index calculations, all dividends are converted into USD at the spot rate of the ex date.

## 2.1.7 Number of Shares and Index Weighting Factor

A dividend amount is expressed per share entitled to the dividend. Since the day before the ex-date is the last day on which the share is entitled to the dividend, the total dividend per security reinvested into an index is equal to the number of shares at the ex-date-1 multiplied by the dividend per share.

In addition, the weighting factor of the security in the index is applied to the total dividend amount to be reinvested. This may be the Domestic Inclusion Factor (DIF), the Foreign Inclusion Factor (FIF), the Value Inclusion Factor (VIF), the Growth Inclusion Factor (GIF) or any inclusion factor considered in the price index calculation.

## 2.2 Reinvestment Methodology

### Gross Daily Total Return

This series approximates the maximum possible dividend reinvestment. The amount reinvested is the dividend distributed to individuals resident in the country of the company, but does not include tax credits.

### Net Daily Total Return

This series approximates the minimum possible dividend reinvestment. Effective December 1, 2009, the dividend is reinvested after deduction of withholding tax by applying the maximum rate of the company's country of incorporation applicable to institutional investors. MSCI uses different withholding tax depending if the indices are international or domestic:

- International indices: the maximum rate applicable to non-resident institutional investors who do not benefit from double taxation treaties.
- Domestic indices: the maximum rate applicable to resident institutional investors

For more information on how taxes are applicable to dividends, please refer to the Appendix for details about the withholding tax rates for the various countries.

#### 2.2.1 Timing of re-investment

The amount of an announced dividend is re-invested on the day the security is quoted ex-dividend on its principal exchange. For securities trading on more than one exchange, MSCI uses the ex-date at the exchange from which MSCI sources the security's price.

If a security does not trade on the day it is quoted ex-dividend, the re-investment is postponed to the day when the security resumes trading.

## 2.2.2 Re-Investment Rules

There are two principal guidelines in accounting for dividends in MSCI's DTR Indices:

- A recurring standard dividend paid out of current earnings will be reinvested among all the constituents in an index. It is not considered in price indices
- A dividend that is unusually large, i.e. at least 5% of the security cum price, or otherwise unlikely to recur on a regular basis or any dividend that is paid for with extraordinary profits is handled by applying a price adjustment factor and is hence taken into account in price indices as well as DTR Indices.

These guidelines are discussed in greater detail below.

## 2.2.3 Dividends Resulting in a Reinvestment Only

The following dividends are reinvested in the DTR Index:

### Regular Cash Dividend

A regular cash dividend is paid out from operating profits: the company distributes a part of the current year's operating profits to its shareholders.

### Optional Dividend

In the case of an optional dividend, the company offers shareholders the choice of receiving the dividend either in cash or in shares. However, shareholders electing the cash option may receive the dividend consideration in cash or shares, or some combination of cash and shares. These dividends are a common practice in the U.S. For dividend reinvestment purposes, MSCI assumes that investors elect the cash option, therefore the dividend is reinvested in the MSCI DTR Indices and price adjustment is not necessary (if the dividend is less than 5% of the cum market price of the underlying security). In the event that shareholders electing the cash option receive the dividend distribution in shares, or a combination of cash and shares, MSCI will increase the number of shares accordingly after results have been officially communicated, with two full business days notice.

In other countries, companies may extend shareholders the choice to participate in certain programs (including, but not limited to Dividend Reinvestment Plans and Bonus Buyback programs). In these cases, MSCI will assume investors choose the default distribution. If no default distribution is available, MSCI will assume investors elect the cash option. If some shareholders choose to take the stock option, when it is confirmed, the number of shares will be increased accordingly at the next regularly scheduled Index Review.

## Interest on Capital

The ‘interest on capital’ dividend is a cash payment to shareholders accounted for as a pre-tax interest expense by the company. The balance sheet and the book value do not change. Interests on capital are common in Brazil.

### 2.2.4 Dividends Resulting in a Reinvestment or in a Price Adjustment

The dividends below are reinvested in the DTR index if, a day prior to the ex-date, the dividend impact on the price is less than 5%.

However, if the impact is at least 5%, the dividend will be reflected in the index through a price adjustment.

## Special/Extra Dividend

The company declares the dividend as special or extraordinary. It is usually funded by a special event or from extraordinary profits. MSCI may consider irregular and unusually large dividends as special even if they are not declared as such by the company.

## Commemorative Dividend (memorial)

A company declares a dividend as commemorative/memorial. The funds come from extraordinary profit or cash generated by a special event.

## Retroactive/Arrears Dividend

Retroactive dividends are paid in Italy when a company has to pay a dividend to revenue-guaranteed (RISP) shares to make up for previous years’ non-payments.

## Special Dividend to Non-Domestic Shareholders

A company pays its non-domestic shareholders a bonus dividend to compensate for the tax credit distributed to domestic shareholders. This is a common practice in New Zealand.

Note that a special dividend is considered a regular cash dividend (‘regular special’) after being distributed for three consecutive years, and if it is proven to have been taken out of recurring operating profits.

### 2.2.5 Dividends Resulting in a Price Adjustment Only

A specific price adjustment is always applied to the security in the following cases:

#### **Stock Dividend (stock bonus/gratis issue)**

The company issues shares at no direct cost to the shareholders. The funds are taken out from the current year's earnings. In the case of a stock bonus/gratis issue, the company distributes a part of the reserves (retained earnings from previous years) to its shareholders.

#### **Capital Repayment (return of capital)**

The company reduces its capital by paying shareholders a cash return, which is a portion of their original investment. It is neither a dividend nor a capital gain, and the shareholders may not have to pay income or capital gains tax. The balance sheet and the book value will decrease.

#### **Dividend Paid in Shares of another Company**

The company distributes stock of another company as a dividend. The number of shares held remains the same, but the price will decrease by the value of the distributed security.

MSCI considers other cash payments related to Corporate Events, such as mergers, acquisitions, liquidations, etc. on a case-by-case basis.

## 2.3 Processing Rules

### 2.3.1 Dividend Data

Raw dividend data is provided by multiple electronic data feeds and is checked for completeness and correctness. MSCI's Daily Total Return process requires that dividends be confirmed by at least two distinct data sources. Most dividends are received and validated through electronic feeds, but some events may require confirmation from other sources, such as stock exchanges or the company. In addition, MSCI monitors securities for which a dividend is expected based on previous dividend announcement frequency, but which has not yet been received through the regular data sources.

## 2.3.2 Corporate Actions

A corporate action, which changes the number of shares outstanding for a company, may take place between the dividend's announcement date and its ex-date. As the number of shares on the day preceding the ex-date is used to calculate the dividend amount to be reinvested, MSCI will adjust the dividend to reflect the number of shares on that day.

Following certain corporate events, the number of shares used in MSCI Index calculations on the day prior to the ex-date may include shares that are not issued yet or that are not entitled to the dividend. In those cases, MSCI reinvests the dividend on the ex-date as if all shares included in MSCI Index calculations were entitled to the dividend.

## 2.3.3 Corrections

A dividend that has been reinvested may need to be amended, due to an error in its ex-date, in the dividend amount, or in the dividend currency. MSCI will give advance notification for dividend corrections that are received after their ex-date. Consequently, the correction in the index will be postponed to the next business day following MSCI's receipt and announcement of the information.

### The following rules apply:

- Action is taken only if the error is discovered within 12 months of the ex date.
- In the case of a correction, MSCI will use the number of shares effective on the day prior to the ex-date. The day's spot rate is used for currency conversion.
- A historical correction will be applied to all indices impacted by more than 50 basis points<sup>1</sup> if the impact on a country or World / EM industry group index is over 50 basis points.
- The security that needs a dividend correction may have changed its status for index inclusion between the ex-date and the correction date. For example, this may be due to the security's subsequent exclusion from the index, or a change in its industry or country classification. Applying the correction with the current status may reinvest dividends into the wrong index. If there is a change in the security status between the ex-date and the correction date, no correction amount will be reinvested.

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<sup>1</sup> The 50 basis point limit is linked to the price index correction policy and will be revised accordingly to reflect any changes in this policy.



### 2.3.4 Payment Default

A correction will be applied when a dividend is declared unpaid (payment default). This may result in a negative reinvestment. Past index values (history) are not corrected.

**The following rules apply:**

- Action is taken only if the payment default is discovered within 12 months of the ex-date and is in line with the price index correction policy, where MSCI applies a 12 month correction period.
- MSCI uses the number of shares effective on the day prior to the original ex-date.
- The default amount is reinvested on the day it is announced. The day's spot rate is used for currency conversion.

### 2.3.5 Late Dividends

A late dividend is a dividend that is only known after its ex-date. It is processed under the correction policy as described in sub-section 2.3.3 above.

### 2.3.6 Country Exceptions

**Korea and Russia: Late Dividend**

Korean and Russian companies declare or may declare their dividends after their ex-date. As no estimated dividends are available before the ex-date and no fluctuation in the price (due to the dividend) is visible on the ex-date, the dividends are reinvested on the next business day following the reception date from the data sources without any correction. MSCI will use the number of shares effective on the day prior to the ex-date.

In the case of Korean and Russian companies declaring their dividends prior to their ex-date, MSCI will reinvest dividends into the MSCI DTR Indices on the day the security is quoted ex-dividend on its principal exchange (in accordance with the section 2.2.1).

Should the dividend amount for Korean and Russian companies change following approval by the shareholders at the general meeting, there will be no correction of the past index levels.

For the depositary receipts (DR) of Russian companies, MSCI will wait until the DR depositary bank announces the dividend amount before reinvesting the dividend on the next business day following the reception date of such dividend amount from MSCI's data sources.

### Japan: Late Dividend

Many Japanese companies declare their dividends after the ex-date. As estimated dividends are available before the ex-date and are broadly used, an estimation of the dividend is reinvested on the ex-date. When a company does not declare an estimated dividend, MSCI will use the previous year amount as the estimation. Should the difference between the estimated and ratified dividend amount warrant correction, it will be processed as a payment default (reinvestment without correcting past index levels) on the next business day following the reception date from the data sources.

### USA: Redemption Right

When a company redeems shares distributed to shareholders due to a poison pill rights issue (applies mainly in USA), there may be a change in the company's capital structure. In this case MSCI will apply a price adjustment.

### 2.3.7 Taxes on Dividends

Shareholders may be taxed on dividend payments. Tax rates vary depending on the company's and shareholder's country of domicile. Tax data is monitored on a regular basis and is updated when necessary.

#### 2.3.7.1 Tax Credit

A tax credit related to a dividend can be considered as a reimbursement of tax already received by the fiscal administration. In countries operating under an imputation tax system, a company's annual earnings are taxed before distribution to the shareholders, and then the shareholders pay taxes on the dividend. Some countries operating under an imputation tax system provide shareholders with a tax credit to offset the amount of the tax they would otherwise owe in respect of the dividend.<sup>1</sup> MSCI does not take into

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<sup>1</sup> Singapore completely migrated to a one-tier tax system from imputation system effective January 1, 2008. Under a one-tier or single-tier tax system, a company pays a tax on its taxable income and shareholders are not charged with a tax on dividends paid to them by the company. Malaysia has been transitioning from the imputation system to a single-tier tax system beginning on January 1, 2008. All Malaysian companies must move to a single-tier tax system by no later than January 1, 2014.

account the amount of a tax credit in calculating either gross or net dividends.

### 2.3.7.2 Withholding Tax

A withholding tax related to a dividend is a tax on the income of the shareholder withheld by the company when the dividend is paid to a shareholder. The withholding tax rate depends on the tax status of the shareholder. MSCI uses the maximum withholding tax rate applicable to institutional investors in calculating MSCI net dividends. A non-resident shareholder must also pay taxes on dividends in his/her domestic country as part of his/her income taxes. Countries may eliminate this double taxation by signing 'bi-lateral' double taxation treaties.

MSCI uses companies' country of incorporation to determine the relevant dividend withholding tax rates in calculating the net dividends and the MSCI net DTR Indices. In cases where the withholding tax rate in the company's country of incorporation is higher than the MSCI company's country of classification as determined in accordance to Appendix III of the MSCI Global Investable Markets Indices Methodology, MSCI will make a specific analysis to determine the actual withholding tax rate applied to non-resident institutional investors.

Companies' country of incorporations are reviewed on a semi-annual basis and changes to companies' withholding tax rates, if any, are made with the May and November Semi-Annual Index Reviews.

In the calculation of the MSCI Net DTR International Indices, MSCI uses the withholding tax rate applicable to non-resident institutional investors that do not benefit from double taxation treaties.

In the calculation of the MSCI Net DTR Domestic Indices, MSCI uses the withholding tax rate applicable to domestic institutional investors.

#### 2.3.7.2.1 Country Exception: Australian Dividends

Some Australian companies pay their dividends with franking credits attached in order to pass on to investors the value of any tax that the company has already paid on its profits. Dividends can be fully franked, partially franked or unfranked. Foreign non-resident investors are subject to the Australian dividend withholding tax on the unfranked portion of a dividend. However, foreign non-resident investors are not subject to the Australian dividend withholding tax on the unfranked portion of the dividend to the

extent that it is declared as conduit foreign income<sup>1</sup> by Australian companies, or on the franked portion of the dividend.

In the calculation of the MSCI Net DTR International Indices for Australian dividends, MSCI uses the withholding tax rate<sup>2</sup> applicable to foreign non-resident institutional investors on the unfranked portion of the dividend that is not designated as conduit foreign income. MSCI does not apply withholding tax rate on the franked portion of the dividend or the unfranked portion of the dividend declared to be conduit foreign income.

In the case that the franking percentage and/or the conduit foreign income not publicly available prior to the ex-date, the franking percentage and/or the conduit foreign income will be assumed zero correspondingly.

The effective withholding tax rate being applied to the Australian dividends in the MSCI Net DTR International Indices is as follows.

Effective withholding tax rate = Australia default withholding tax rate x (100% - franking % - conduit foreign income %)

## Examples of Calculation

	Franking Percentage	Conduit Foreign Income Percentage	Default Withholding Tax Rate	Effective Withholding Tax Rate	Gross Amount	Net Amount
Security A	100%	0%	30%	0%	AUD 2.56	AUD 2.56
Security B	75%	25%	30%	0%	AUD 1.47	AUD 1.47
Security C	50%	0%	30%	15%	AUD 1.00	AUD 0.85
Security D	0%	50%	30%	15%	AUD 2.00	AUD 1.70

<sup>1</sup> Conduit foreign income is foreign income received by a foreign resident via an Australian corporate tax entity, and is that income which would ordinarily not be taxed under the relevant Australian tax laws (source: Australian Government, The Treasury).

<sup>2</sup> Please refer to the Appendix for the latest withholding tax rate for Australia.

### 2.3.8 Definitions

- **Announcement date** - the date on which the company announces its next dividend payment.
- **Reception date** - the date on which the information about the dividend is received by MSCI from its data sources.
- **Record date** - the date on which an individual must own shares (be the holder of record) in order to receive a declared dividend or capital gains distribution.
- **Ex-date** - the first day on which, if an investor buys the security, the security no longer carries the right to the declared dividend.

## Section 3: Gross Domestic Products (GDP) Weighted Indices

The MSCI GDP Indices offer an alternative to market capitalization-weighted indices for global and regional asset allocation purposes. In the MSCI GDP Indices, country weights are based on the size of the country's economy rather than the size of its equity market. While equity markets can have performance-related peaks and troughs, GDP figures are more stable over time. The MSCI GDP Indices include the MSCI GDP ACWI, World, EAFE, Europe, EMU and EM Indices.

### Annual Index Review and Country Weights

The MSCI GDP Indices are rebalanced annually in May. The rebalancing date has been changed in 2002 to May from June to coincide with the annual full index review of the MSCI Standard Indices.

The country weights of the MSCI GDP Indices are reset every year on the basis of the previous year's GDP figures. Afterwards, the country weights fluctuate with changes in performance and market capitalization in the MSCI Standard Country Indices until the next rebalancing.

The primary sources for GDP data are the Organization for Economic Cooperation and Development (OECD), the International Monetary Fund (IMF) and other various government organizations. In some cases, GDP estimates may be used if final figures are not available at the time of the rebalancing. MSCI uses GDP figures for the calculation of the GDP weighted Indices.

GDP figures provided by the OECD are in USD at current prices and current exchanges rates. IMF GDP figures are provided in local currency and converted in USD at the period average market rate. For GDP figures in local currency provided by other sources, MSCI applies an average of the previous year's daily exchange rates to calculate the USD-equivalent GDP figures.

For the Emerging Markets (EM) GDP Index as well as All Country World Index (ACWI) GDP Index, MSCI provides historical index levels back to June 30, 2000. Prior historical index levels for these indices are only available on a custom basis. Changes in country indices within EM and ACWI or migrations from Emerging to Developed Market indices are implemented to coincide with the Annual GDP Index Review. As such, as of the close of June 29, 2001, MSCI Egypt and Morocco were added to the EM and ACWI GDP Indices whilst MSCI Sri Lanka was removed. Simultaneously, MSCI Greece migrated from the Emerging to the Developed Markets GDP Indices.

As a reminder, Developed Markets (DM) GDP Indices, such as The World Index, EAFE and Europe have a price index level history available since December 31, 1969 on a monthly basis, and since December 31, 1987 on a daily basis, whereas EMU's entire index level history goes back to June 30, 1998. In addition to the country migrations mentioned above, the most recent country level changes include the inclusion of MSCI Portugal into the Developed Markets GDP Indices as of the close of June 30, 1998, and the removal of MSCI Malaysia as of the close of September 30, 1998.

## Security level Weights

The weight of a security in the GDP Indices is determined by multiplying the weight of the security in the MSCI Standard Country Index by the current weight of the country in the regional MSCI GDP Index.

$$SW_{GDP} = SW_{STD} * CW_{GDP\_CUR}$$

Where:

$SW_{GDP}$	security weight in the regional MSCI GDP Index
$SW_{STD}$	security weight in the MSCI Standard Country Index
$CW_{GDP\_CUR}$	current country weight in the regional MSCI GDP Index

Current country weight:

$$CW_{GDP\_CUR} = \frac{(\text{CountryGDP}_{INI} * \text{McapCountry}_{CUR} / \text{McapCountry}_{INI})}{\text{SUM} (\text{CountryGDP}_{INI} * \text{McapCountry}_{CUR} / \text{McapCountry}_{INI})}$$

Where:

$CW_{GDP\_INI}$	initial country weight in the regional MSCI GDP Index at the last rebalancing
$\text{McapCountry}_{CUR}$	current country market capitalization in the MSCI Standard Index
$\text{McapCountry}_{INI}$	initial country market capitalization at the last rebalancing in the MSCI Standard Index

# Appendices



### Appendix I: Saturday/Sunday Index Calculation

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#### Calculation Methodology

A selected list of MSCI Indices is calculated on Saturdays and Sundays to reflect the performance of the markets open on these days.

In order to preserve compatibility with the other MSCI International Indices, which are calculated from Monday to Friday, MSCI use the concept of a Monday pre-opening (intermediate) calculation for the Saturday and Sunday calculation. The Saturday and Sunday index performances capture the price changes and reflect corporate events effective on these days.

In case of corporate events occurring on Saturdays and where a Price Adjustment Factor (PAF) is needed, the PAF is applied to the market price of the security on Saturday, Sunday and Monday. If the security does not trade on Monday, the Sunday closing market price is carried forward to Monday, including the PAF.

In case of corporate events occurring on Sundays and where a PAF is needed, the PAF is applied to the security on Sunday and Monday. If the security does not trade on Monday, the Sunday closing market price is carried forward to Monday, including the PAF.

Changes in the security's number of shares, FIFs and/or DIFs due to corporate events occurring on Saturdays or Sundays are implemented as of the close of Monday, regardless of whether the corporate event requires the application of a PAF on Saturday and/or Sunday or not.

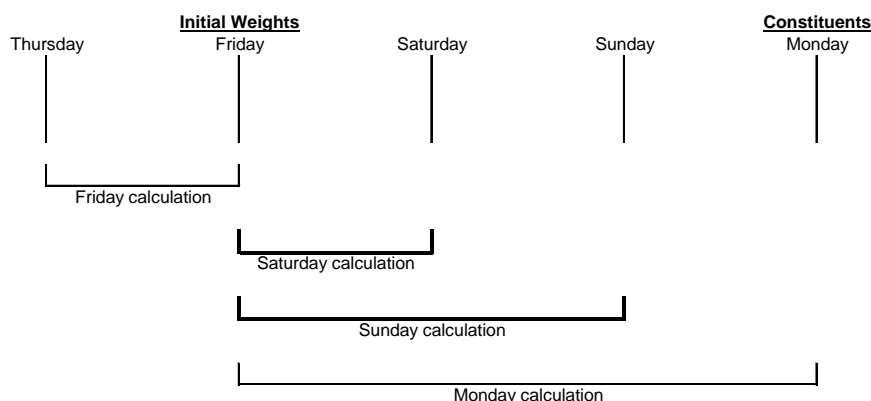
The index constituent list is the same as the one to be used for the Monday calculation.

WM/Reuters spot FX rates as of the previous Friday is carried forward to the Saturday and Sunday in order to perform the index calculation in USD.

No dividends are reinvested on Saturdays or Sundays. Consequently, the Daily Total Return (DTR) index performances for these 2 days are equal to the ones of the price index.

The chain-linking for these indices can be summarized as follows:

- Saturday's daily index performance is computed by comparing Saturday's adjusted prices and the previous Friday's unadjusted prices
- Sunday's daily index performance is computed by comparing Sunday's adjusted prices and the previous Friday's unadjusted prices
- Monday's daily index performance is computed, as currently, by comparing Monday's adjusted prices and the previous Friday's unadjusted prices



## Index Calculation Formulas

$$IndexLevelLocal_{Saturday/Sunday} = IndexLevelLocal_{Friday} * \frac{\sum_{s \in I, Monday} (SecurityAdjustedFullMarketCapForLocal_{Saturday/Sunday} * InclusionFactor_{Monday})}{\sum_{s \in I, Monday} (SecurityInitialFullMarketCapUSD_{Saturday/Sunday} * InclusionFactor_{Monday})}$$

$$IndexLevelUSD_{Saturday/Sunday} = IndexLevelUSD_{Friday} * \frac{\sum_{s \in I, Monday} (SecurityAdjustedFullMarketCapUSD_{Saturday/Sunday} * InclusionFactor_{Monday})}{\sum_{s \in I, Monday} (SecurityInitialFullMarketCapUSD_{Saturday/Sunday} * InclusionFactor_{Monday})}$$

Where:

- $InclusionFactor_{Monday}$  is the inclusion factor of the security  $s$  as of the following Monday. The inclusion factor can be one or the combination of the following factors: Foreign Inclusion Factor, Domestic Inclusion Factor, Growth Inclusion Factor, Value Inclusion Factor, Index Inclusion Factor (\*).

The Security Full Market Caps are calculated as follows:

$$\text{SecurityAdjustedFullMarketCapForLocal}_{\text{Saturday/Sunday}} = \frac{\text{IndexNumberOfShares}_{\text{Friday}} * \text{PricePerShare}_{\text{Saturday/Sunday}} * \text{PAF}_{\text{Saturday/Sunday}} * \frac{\text{ICI}_{\text{Monday}}}{\text{ICI}_{\text{Friday}}}}{\text{FXrate}_{\text{Friday}}}$$

$$\text{SecurityAdjustedFullMarketCapUSD}_{\text{Saturday/Sunday}} = \frac{\text{IndexNumberOfShares}_{\text{Friday}} * \text{PricePerShare}_{\text{Saturday/Sunday}} * \text{PAF}_{\text{Saturday/Sunday}}}{\text{FXrate}_{\text{Saturday/Sunday}}}$$

$$\text{SecurityInitialFullMarketCapUSD}_{\text{Saturday/Sunday}} = \frac{\text{IndexNumberOfShares}_{\text{Friday}} * \text{PricePerShare}_{\text{Friday}}}{\text{FXrate}_{\text{Friday}}}$$

Where:

- $\text{IndexNumberOfShares}_{\text{Friday}}$  is the number of shares of security s as of the previous Friday.
- $\text{PricePerShare}_{\text{Saturday/Sunday}}$  is the price per share of the security s as of Saturday or Sunday.
- $\text{PricePerShare}_{\text{Friday}}$  is the price per share of security s as of the previous Friday.
- $\text{PAF}_{\text{Saturday/Sunday}}$  is the Price Adjustment Factor of the security s as of Saturday or Sunday.
- $\text{FXrate}_{\text{Saturday/Sunday}}$  is the FX rate of the price currency of security s vs USD as of Saturday or Sunday. It is the value of 1 USD in foreign currency.
- $\text{FXrate}_{\text{Friday}}$  is the FX rate of the price currency of security s vs USD as of the previous Friday. It is the value of 1 USD in foreign currency.
- $\text{ICI}_{\text{Monday}}$  is the Internal Currency Index of price currency as of Monday. The ICI is different than 1 when a country changes the internal value of its currency (e.g. from Turkish Lira to New Turkish Lira – ICI = 1,000,000).
- $\text{ICI}_{\text{Friday}}$  is the Internal Currency Index of price currency as of previous Friday.

## Appendix II: Annualized Traded Value Ratio (ATVR) and Annual Traded Value

### Calculation Methodology

The Annualized Traded Value Ratio (ATVR) is used to measure liquidity. MSCI Barra uses ATVR as an investability criterion to determine the inclusion of securities into the MSCI Indices.

MSCI Barra distributes ATVR fields on a monthly basis. Below the fields that are distributed are defined. Note that the data used by MSCI Barra during the index reviews may differ from the data distributed.

### ATVR Calculation Formulas

#### 1. Monthly Median Traded Value

Taking the median screens out extreme daily trading volumes:

$$\text{MonthlyMedianTradedValue}_{MonthN} = \text{MedianTradedValueUSD}_{MonthN} * \text{NbOfSecurityTradingDays}_{MonthN}$$

Where:

$$\text{MedianTradedValueUSD}_{MonthN} = \text{Median}[\text{DailySecurityTradedValueUSD}_{MonthN}]$$

$$\text{DailySecurityTradedValueUSD}_t = \text{DailySecurityTradedVolume}_t * \text{PricePerShare}_t / \text{FXrate}_t$$

- $\text{NbOfSecurityTradingDays}_{MonthN}$  is the number of days in the month where the security has been traded
- $\text{DailySecurityTradedVolume}_t$  represents the number of securities traded during the day t
- $\text{PricePerShare}_t$  is the price per share of the security s at time t.
- $\text{FXrate}_t$  is the FX rate of the price currency of security s vs. USD at time t. It is the value of 1 USD in foreign currency.

#### 2. Monthly Traded Value Ratio (MTVR)

Dividing the monthly median traded value of a security by its free float-adjusted security market capitalization at the end of the month gives the monthly median traded value ratio

$$\text{MTVR\_FIFAd}_{MonthN} = \text{MonthlyMedianTradedValue}_{MonthN} / \text{SecurityHFAdjustedMarketCapUSD}_{MonthN\_endtry}$$

$$MTVR\_DIFAdj_{MonthN} = MonthlyMedianTradedValue_{MonthN} / SecurityDIFAdjustedMarketCapUSD_{MonthN\_endday}$$

Where:

- *SecurityFFAdjustedMarketCapUSD<sub>MonthN\\_endday</sub>* is the security market capitalization at the end of the month, *SecurityAdjustedMarketCapUSD<sub>MonthN\\_endday</sub>*, adjusted with FIF
- *SecurityDIFAdjustedMarketCapUSD<sub>MonthN\\_endday</sub>* is the security market capitalization at the end of the month, *SecurityAdjustedMarketCapUSD<sub>MonthN\\_endday</sub>*, adjusted with DIF

### 3. Annualized Traded Value Ratio (ATVR)

$$ATVR\_FIFAdj_{MonthN} = \sum_{i \in N, N-1 \dots N-11} MTVR\_FIFAdj_{Month\_i}$$

$$ATVR\_DIFAdj_{MonthN} = \sum_{i \in N, N-1 \dots N-11} MTVR\_DIFAdj_{Month\_i}$$

The ATVR is not calculated when less than 12 months of monthly traded value ratios are available.

### 4. Annual Traded Value

The annual traded value is the sum of the monthly median traded values.

$$AnnualTradedValue_{MonthN} = \sum_{i \in N, N-1 \dots N-11} MonthlyMedianTradedValue_{Month\_i}$$

The Annual Traded Value is not calculated when less than 12 months of monthly median traded values are available.

### 5. Aggregated information

In the calculation of the aggregated information, the trading volumes in depository receipts associated with that security, such as ADRs or GDRs, are also considered. It is obtained by summing up the ATVR of each listing.

Aggregated FIF/DIF adjusted ATVR is the sum of FIF/DIF adjusted ATVR of K securities that are

linked by the same issuer, share class and share type:

$$AggregatedATVR\_FIFA_{MonthN} = \sum_{i \in 1, 2, \dots, K} ATVR\_FIFA_{MonthNlinkedSeci}$$

$$AggregatedATVR\_DIFA_{MonthN} = \sum_{i \in 1, 2, \dots, K} ATVR\_DIFA_{MonthNlinkedSeci}$$

Aggregated ATVR is calculated even if less than 12 months of monthly median traded values are available for one, several or all listings. When less than 12 months are available for a given listing, MSCI Barra will use the ATVR based on the monthly median traded values for the last 6 months, 3 months or 1 month for that listing (depending on data availability).

The Aggregated Annual Traded Value includes trading volumes in depositary receipts or other alternate listings associated with that security. It is obtained by summing up the Annual Traded Values of each listing:

$$AggregatedAnnualTradedValue_{MonthN} = \sum_{i \in 1, 2, \dots, K} AnnualTradedValue_{MonthNlinkedSeci}$$

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### Appendix III: Exchange Rates

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#### Closing Spot Rates

Until December 30, 1993, MSCI used the exchange rates taken from the Reuters multi contributor pages at 4.00PM CET.

Since December 31<sup>st</sup>, 1993, MSCI has been using the WM/Reuters Closing Spot Rates, taken at 4PM London time, for all the countries for which it provides indices, except for the Latin American countries. At the time, MSCI established a special foreign exchange policy for Latin American countries in view of the risks of important movement of currencies in some of these markets between the 4PM London closing and the close of the respective Latin American markets.

Starting July 26, 2000, MSCI began to use the WM/Reuters Closing Spot Rates for all the countries it provides indices including Latin American countries.

In case WM/Reuters does not provide rates for specific markets on given days (for example Christmas Day and New Year Day), the previous business day's rates are normally used.

MSCI independently monitors the exchange rates on all its indices. MSCI may under exceptional circumstances elect to use alternative sources of exchange rates if the WM/Reuters rates are not available, or if MSCI determines that the WM/Reuters rates are not reflective of market circumstances for a given currency on a particular day. In such circumstances, an announcement would be sent to clients with the related information. If appropriate, MSCI may conduct a consultation with the investment community to gather feedback on the most relevant exchange rate.

#### Forward Rates

MSCI uses the spot and 1-month premium/discount as provided by WM/Reuters to compute the 1-month Forward exchange rates. These values are taken at 4PM London time

### Appendix IV: Singapore & Malaysia – A History of Inclusion in the Emerging and Developed Markets Indices

#### Stock Markets

Stock trading has a long history in Singapore dating back to the 1930's. In 1960 the Malayan Stock Exchange started trading shares publicly. There were trading floors in both Singapore and Kuala Lumpur linked as a single market. When Singapore split from Malaysia the stock exchange continued to operate as one under the name Stock Exchange of Malaysia and Singapore (SEMS). In 1973 the accord that allowed for the convertibility at par between the Singapore Dollar and Malaysian Ringgit was terminated. This led to the separation of SEMS into the Kuala Lumpur Stock Exchange (KLSE) and the Stock Exchange of Singapore (SES). Malaysian companies continued to trade heavily in Singapore.

#### MSCI Indices

On December 1st 1972, the MSCI Singapore/Malaysia Index was added to the World Index. The index was developed in cooperation with the Overseas-Chinese Banking Corporation, which published the same index under the name O.C.B.C. Index. As is the case with other MSCI Indices the purpose was to track those securities representative of Singapore. However as approximately half the market capitalization and liquidity of the SES was due to Malaysian shares the index was designed to incorporate both Singaporean companies as well as those Malaysian shares that traded in Singapore. This aspect was different from other MSCI Indices, as the norm is to only include domestically listed shares. In light of the long integrated history of the Malay Peninsula and Singapore, and the continued dual listing of shares, it was deemed to be more representative to include these Malaysian companies as representative of the opportunity set of the SES.

MSCI launched its emerging market series on January 1, 1988. Among other country indices was an index of Malaysia with 59 securities. As MSCI was now covering emerging markets the MSCI Mexico Index was pulled out of MSCI World. The World Index was to be considered a developed market index.

In 1989 the Malaysian government announced that Malaysian companies would be asked to delist their shares from the SES. Previously the government had prohibited newly listed shares of Malaysian companies from listing on the SES. In November 1989, reacting to the Malaysian government announcement, MSCI initially announced its intention to remove Malaysian securities from the



Singapore/Malaysia index. The following month MSCI announced that the terms and timing of the Malaysian delisting were too ambiguous. As a result MSCI would take a wait and see approach prior to removing any Malaysian securities from the Singapore/Malaysia index. As a result the Malaysian shares in the MSCI Singapore/Malaysia Index were effectively frozen or grandfathered. Over time, some of these shares were no longer listed on Singapore but continued to be included in the index using the Ringgit price at which they were traded in Kuala Lumpur.

In January 1992 MSCI announced a change. The Singapore/Malaysia index was now composed of a representative sampling of Singaporean companies coupled with grandfathered Malaysian securities that used to trade in Singapore but were no longer trading there as a result of the delisting requirement. Malaysia was clearly an emerging market, for example its GDP per capita was \$2,340 considerably below that of Spain (\$10,920), the lowest country that was currently in the MSCI World Index. Nonetheless many developed market investors had historically purchased Malaysian companies as a result of some Malaysian companies being included in the MSCI World and EAFE Indices. Deleting all Malaysian companies from the developed market indices could have been very disruptive to the markets. As a result of this dilemma MSCI decided to add Malaysia as a country to the World and related developed market indices while continuing to include Malaysia in the emerging market series. One could not have a credible emerging market series without the continued inclusion of Malaysia in that series.

Thus Malaysia was to be represented in both the developed and emerging market series. At the time MSCI acknowledged that the existence of Malaysia in both the developed and emerging market series was less than ideal. As of April 30th 1993 Malaysia was fully added to the developed market series, resulting in the addition of approximately 40 securities. This was because the MSCI Malaysia Index was designed to represent the profile of the entire Malaysian market whereas the current Malaysian stocks in the World and EAFE Indices were selected to reflect the composition of those Malaysian stocks trading in Singapore. ACWI clients would not have to worry about double counting as Malaysia was represented at its appropriate market cap weight. The index of Singapore represented the continuation of the Singapore/Malaysia index and therefore retains its base date of December 31, 1969. Developed and emerging market indices excluding Malaysia were calculated for those clients who preferred a different classification.

## The Asian Crisis

The “Asian Crisis”, starting in 1997 with the devaluation of the Thai Baht eventually spread to Malaysia. On September 1st 1998 Malaysia imposed a series of restrictions on the convertibility of the Ringgit. These controls effectively prohibited the repatriation of funds. On Sept 4th, 1998 MSCI announced that

effective Sept 30th Malaysia would be removed from the EAFE and World Indices and that its status in EMF was under review. In the MSCI announcement of the change it was stated “...the limitations in repatriating investment proceeds would seriously challenge the objective and integrity of the MSCI Developed Markets Indices, were the Malaysian securities to remain in these indices.” These restrictions imposed by the government of Malaysia thus ended the legacy issue of Malaysian securities appearing in both the developed and emerging market series.

On Sept 28th, 1998 MSCI announced that Malaysia would be removed from the MSCI EMF and ACWI Free series as of the close of November 30th, 1998. As part of the capital controls imposed, foreign investors became obligated to hold Malaysian securities for a period of one-year commencing Sept 1st, 1998, before any possible capital repatriation. The authorities also imposed a fixed exchange rate of 3.8 Ringgit to the US dollar. The measures taken by the government along with the lack of transparency meant that Malaysia’s inclusion in the Free series of indices was no longer justified. A discount of 30% was applied to the valuation of the MSCI Malaysia Index in US dollars, effective Sept 30th, 1998. The discount was applied because market forces no longer determined the official exchange rate.

On February 5th, 1999 MSCI announced that effective February 26th, 1999 the discount would be reduced to 15%. This followed the Malaysian Government announcement on the previous day that it was alleviating the restrictions on the repatriation of investments.

As a result of the removal of the restrictions on the repatriation of capital, MSCI announced on August 12, 1999, the removal of the 15% discount effective August 30, 1999. On November 23, 1999, MSCI announced that Malaysia would be re-included fully at 100% in the EMF and AC Free indices as of May 31, 2000.

MSCI Malaysia Indices will be removed from the MSCI Emerging Markets Free (EMF) series and the MSCI All Country (AC) Free Indices effective as of the close of 30th November, 1998. Of course Malaysia was not readmitted to the developed market series, as its inclusion there was a result of the previously explained anomaly.

### Quick Facts

#### Malaysia was part of the Developed Market indices:

- From December 1, 1972 to May 2, 1993, MSCI calculated a combined index, the Singapore/Malaysia index - due to the history of Malaysian securities trading in Singapore.

- From May 3, 1993 up to the close of Sep 30, 1998, Malaysia was part of DM as an individual country (separated from Singapore).

**Malaysia has been part of the Emerging Market indices from 1987 to present:**

- With a discount of 30% from Sep 30, 1998 to Feb 25, 1999
- With a discount of 15% from Feb 26, 1999 to Aug 29, 1999
- With no discount since Aug 30, 1999

**Malaysia has been part of the EMF index:**

- From 1987 to Nov 30, 1998
- And since June 1, 2000

### Appendix V: Singapore and Singapore Free

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**What is the difference between the MSCI Singapore Index and the MSCI Singapore Free Index; the MSCI EAFE Index and the MSCI EAFE Free Index; the MSCI World Index and the MSCI World Free Index?**

In the 1990s, Singapore enacted a system to prevent companies in strategic industries (mainly banks, airlines and the media) from being controlled by foreigners. Certain shares had limits on the percent that could be purchased by foreigners. Once the limit was reached, these shares traded at a premium price. The MSCI Singapore Free Index used the prices at which foreigners could trade.

MSCI also started calculating the regional indices, MSCI World Free Index, MSCI EAFE Free Index and MSCI Pacific Free Index to include the MSCI Singapore Free Index as well as to reflect investment restrictions in some of the Nordic countries and Switzerland. The MSCI Singapore Index (non-free version) reflected the investment opportunities applicable to domestic investors.

In May of 1999, the foreign ownership restrictions in Singapore were lifted and as of that date, the MSCI Singapore Index and MSCI Singapore Free Index and the corresponding regional developed market Free and non-Free indices have had the same constituent market caps and performance. Only the absolute index levels continue to differ. MSCI will continue both the Free and Non-Free versions of MSCI Singapore Index, MSCI EAFE Index and MSCI World Index to reflect the differing history.

## Appendix VI: Withholding Tax Rates

Country Of Incorporation		Withholding Tax Rates (%) <sup>(1)</sup>	
Code	Name	Foreign	Domestic
AE	United Arab Emirates	0	0
AN	Netherlands Antilles	0	
AR	Argentina	0	
AT	Austria	25	
AU	Australia <sup>(2)</sup>	30	
BD	Bangladesh	20	
BE	Belgium	25	
BG	Bulgaria	5	
BH	Bahrain	0	0
BM	Bermuda	0	
BR	Brazil <sup>(3)</sup>	0	
BS	Bahamas	0	
BW	Botswana	15	
CA	Canada	25	
CH	Switzerland	35	
CL	Chile	21.69	
CN	China <sup>(4)</sup>	0 or 10	10
CO	Colombia	0	
CY	Cyprus	0	
CZ	Czech Republic	15	
DE	Germany	26.375	
DK	Denmark	28	
EE	Estonia	0	
EG	Egypt	0	
ES	Spain	19	
FI	Finland	28	
FR	France	25	
GB	United Kingdom	0	
GG	Guernsey	0	
GH	Ghana	8	

Country Of Incorporation		Withholding Tax Rates (%) <sup>(1)</sup>	
Code	Name	Foreign	Domestic
KR	Korea	22	
KW	Kuwait	15	0
KY	Cayman Islands	0	
KZ	Kazakhstan	0	
LB	Lebanon	10	
LI	Liechtenstein	4	
LK	Sri Lanka	10	
LR	Liberia	15	
LT	Lithuania	15	
LU	Luxembourg	15	
MA	Morocco	10	
MH	Marshall Islands	0	
MK	Macedonia	10	
MU	Mauritius	0	
MX	Mexico	0	
MY	Malaysia	0	
NG	Nigeria	10	
NL	Netherlands	15	
NO	Norway	25	
NZ	New Zealand	15	
OM	Oman	0	0
PA	Panama	10	
PE	Peru	4.1	
PH	Philippines	30	
PK	Pakistan	10	
PL	Poland	19	
PR	Puerto Rico	10	
PT	Portugal	20	
QA	Qatar	0	0
RO	Romania	16	

# MSCI Index Calculation Methodologies

Country Of Incorporation		Withholding Tax Rates (%) <sup>(1)</sup>	
Code	Name	Foreign	Domestic
GI	Gibraltar	0	
GR	Greece	10	
HK	Hong Kong	0	
HR	Croatia	0	
HU	Hungary	0	
ID	Indonesia	20	
IE	Ireland	20	
IL	Israel	20	
IM	Isle Of Man	0	
IN	India	0	
IT	Italy <sup>(5)</sup>	27	
JE	Jersey	0	
JM	Jamaica	33.333	
JO	Jordan	0	
JP	Japan	7	
KE	Kenya	10	

Country Of Incorporation		Withholding Tax Rates (%) <sup>(1)</sup>	
Code	Name	Foreign	Domestic
RS	Serbia	20	
RU	Russia	15	
SA	Saudi Arabia	5	0
SE	Sweden	30	
SG	Singapore <sup>(6)</sup>	0	
SI	Slovenia	15	
TH	Thailand	10	
TN	Tunisia	0	
TR	Turkey	15	
TT	Trinidad And Tobago	15	
TW	Taiwan	20	
UA	Ukraine	15	
US	USA	30	30
VG	British Virgin Islands	0	
VN	Vietnam	0	
ZA	South Africa	0	

Note:

1. Used in the calculation of the MSCI Net Daily Total Return (DTR) Indices. Withholding tax rates used are the maximum rates of the company's country of incorporation applicable to institutional investors who do not benefit from double taxation treaties. Foreign rates are used in the MSCI Net DTR International Indices and Domestic rates are used in the MSCI Net DTR Domestic Indices.
2. For Australian dividends, franking percentage and conduit foreign income are taken into consideration on calculation of the MSCI Net DTR Indices. The actual withholding tax rate for an Australian dividend ranges from 0% to 30%. For details, please refer to the section 2.3.7.2.1.
3. Interest on capital is subject to a 15% withholding tax.
4. For the MSCI China Index, the withholding tax rates are exceptionally based on Chinese securities' share types, regardless of the company's country of incorporation. B-share and H-share are subject to a 10% withholding tax. P-Chip is subject to a 0% withholding tax. Red Chip withholding tax rate is reviewed on a case-by-case basis and is generally subject to 0%, unless a specific withholding tax rate of 10% is announced by the companies.
5. Dividends on Saving shares are subject to a 12.5% withholding tax.
6. Dividends on Real Estate Investment Trusts (REITS) are subject to a 10% withholding tax.

## Appendix VII: Closing Prices Policy

### Prices used in MSCI End of Day Index Calculations, as of May 2010

Unless otherwise indicated, the prices used to calculate the MSCI Indices are the official exchange closing prices or those figures accepted as such.

When prices are not available due to holidays or other markets closures, MSCI will carry the previous day's closing prices forward.

Please note that MSCI reserves the right to use an alternative pricing source on any given day.

The sources listed below are the "standard" MSCI pricing sources.

Country	Exchange	Reuters Code	Bloomberg Code	Market Identifier Code (MIC)	Price used	Description (For more detailed information, please contact the relevant exchange)	Closing Prices availability (local time)
Argentina	Bolsa de Comercio de Buenos Aires	.BA	AF	XBUE	Last traded price	Last round lot trade with a 72 hour settlement basis. Round lots in Argentina-Bolsa de Comercio de Buenos Aires vary for each stock and are established on a daily basis.	5:00PM
Argentina (US listed Depository Receipts)	NASDAQ Global Select Market	.OQ	UW	XNGS	see USA (NASDAQ Global Select Market)	see USA (NASDAQ Global Select Market)	see USA (NASDAQ Global Select Market)
Argentina (US listed Depository Receipts)	NYSE	.N	UN	XNYS	see USA (NYSE)	see USA (NYSE)	see USA (NYSE)
Australia	Australian Stock Exchange (ASX)	.AX	AU	XASX	Auction close	The closing price is determined in a single price auction which takes place at the end of normal trading.	4:12PM
Austria	Vienna Stock Exchange	.VI	AV	WBAH	Auction close	The chosen price is the price for which the highest number of orders can be executed. The auction begins at 5:30PM.	5:35PM
Belgium	Brussels Stock Exchange	.BR	BB	XBRU	Auction close	The closing price is an auction price calculated between 5:30PM and 5:35PM. It is still possible to trade at the auction price between 5:30PM and 5:40PM.	5:35PM
Bahrain	Bahrain Stock Exchange	.BH	BI	XBAH	Last traded price	Last traded price	12:30PM
Botswana	Botswana Stock Exchange	.BT	BG	XBOT	Last traded price	Last traded price	3:00PM

## MSCI Index Calculation Methodologies

Brazil	Bovespa (Sao Paulo SE)	.SA	BS	XBSP	Auction close	For all listed companies on the electronic trading system, there is a 'closing call' between 5.55PM and 6.00PM (4:55PM and 5:00PM*).	6:00PM (5:00PM*)
Bulgaria	Bulgarian Stock Exchange (Sofia)	.BB	BU	XBUL	Last Traded Price	Last Traded Price	2:00PM
Canada	Toronto Stock Exchange	.TO	CT	XTSE	Market on Close / Last traded price	Market on Close (MOC) auction for MOC eligible stocks. Last traded price for stocks not eligible for the MOC auction.	4:10PM / 4:00PM
Chile	Bolsa de Comercio de Santiago	.SN	CC	XSGO	VWAP	The Official Close is calculated using a volume weighted average price of the trades in the last ten minutes of the trading day. For a trade that occurs within the last ten minutes of trading to be included in the VWAP calculation, the volume of each trade must meet a set volume determined by the exchange at the open of each month	5:30PM (4:30PM*)
China	Hong Kong Stock Exchange	.HK	HK	XHKG	See Hong Kong	See Hong Kong	See Hong Kong
China	Shanghai Stock Exchange	.SS	CG	XSHG	VWAP	Volume Weighted Average Price of all trades conducted in the last minute of trading prior to the close (including the last trade). If there is no concluded transaction on that day, the previous closing price is used as the day's closing price.	3:05PM
China	Shenzhen Stock Exchange	.SZ	CS	XSHE	VWAP	Volume Weighted Average Price of all trades conducted in the last minute of trading prior to the close (including the last trade). If there is no concluded transaction on that day, the previous closing price is used as the day's closing price.	3:05PM
China	NYSE	.N	UN	XNYS	See USA (NYSE)	See USA (NYSE)	See USA (NYSE)
Colombia	Bolsa de Valores de Colombia	.CN	CX	XBOG	Last traded price	The closing price is the price of the last transaction which meets a number of shares threshold between 9:30AM and 12:00PM (11:30AM at the end of the month). The exchange defines the threshold based on price ranges.	1:00PM (12:00PM*) / 12:30AM (11:30PM*)
Colombia (US listed Depository Receipts)	NYSE	.N	UN	XNYS	see USA (NYSE)	see USA (NYSE)	see USA (NYSE)
Croatia	Zagreb Stock Exchange	.ZA	ZA	XZAG	VWAP	The official closing price is the Volume Weighted Average Price of trades throughout the entire trading day.	4:00PM
Croatia	Zagreb – Vrazdin Segment	.ZA	VA	XZAG	VWAP	The official closing price is the Volume Weighted Average Price of trades throughout the entire trading day.	4:00PM
Czech Republic	Prague Stock Exchange (SPAD)	.PR	CD	XPRA	Official Close	For SPAD trading, closing price is defined as the middle of the high limit and low limit at the end of open phase trading at 4:00PM (local time). Trading ends at 4:00PM local time, but the Official Closing Price is published at 5:00PM (local time).	5:00PM



## MSCI Index Calculation Methodologies

Denmark	Copenhagen Stock Exchange	.CO	DC	XCSE	Auction close	The closing call auction will begin when the trading session ends at 4:50PM. It will run until 5:00PM. The closing price will be generated in the closing call auction. If no trades are executed during the closing call auction, the closing price will correspond to the last transaction.	5:00PM
Egypt	Cairo Stock Exchange	.CA	EC	XCAI	VWAP	The closing price of a security traded on CASE (Cairo Stock Exchange) is the Volume Weighted Average Price which is equal to the total value traded of the security divided by the total volume traded of the same security, provided that the security trades at least 100 shares in the daily trading session. In case the security trades less than 100 shares, the previous day's closing price is considered to be the official closing price.	2:30PM
Estonia	Tallinn Stock Exchange	.TL	ET	XTAL	Auction Close	In the course of the closing auction, transaction orders are matched in the order book according to the equilibrium price. The equilibrium price is achieved only if the prices of buy and sell orders entered in the order book are crossing or equal. An auction is not held unless there are transaction orders with crossing prices.	2:00PM
Finland	Helsinki Stock Exchange	.HE	FH	XHEL	Auction close	As of Sep 27 2004, the official closing price is the result of the closing call which occurs during the last 10 minutes of trading. If no trades are matched in the closing call then the last trade prior to the auction will be defined as the closing price.	6:30PM
France	Paris Stock Exchange	.PA	FP	XPAR	Auction close	The closing price is an auction price calculated between 5:30PM and 5:35PM. It is still possible to trade at the auction price between 5:30PM and 5:40PM.	5:35PM
Germany (XETRA)	XETRA Exchange	.DE	GY	XETR	Auction close	The Auction price is defined during the auction that closes the trading session. The chosen price is the price for which the highest number of orders can be executed.	5:35PM
Ghana	Ghana Stock Exchange	.GH	GN	XGHA	Last traded price	Last traded price	17:30PM
Greece	Athens Stock Exchange	.AT	GA	XATH	VWAP	The official closing price is the weighted average price of the last 10% of the trades that were executed during the day and is available after the T1 continuous trading session that ends at 17:20 local time.	5:20PM
Hong Kong	Hong Kong Stock Exchange	.HK	HK	XHKG	Auction Close / Median Price	If there is closing auction session for the security, final Indicative Equilibrium Price (IEP) would be taken as auction close price. Otherwise, median price would be applied. The median price is determined by taking the median of five nominal prices in the last minute of the trading hours to avoid the closing price being biased by one single trade. HKSE takes up to 5 snapshots of the nominal prices at interval of every 15 seconds starting from 3:59PM, local time.	4:15PM
Hungary	Budapest Stock Exchange	.BU	HB	XBUD	Last traded price	Last traded price	4:30PM
India	The Bombay Stock Exchange	.BO	IB	XBOM	WAP	The Weighted Average Price is defined as the volume weighted average of all orders executed within the last 15 minutes of the continuous trading session. If there are no trades during the last 15 minutes, then the last traded price in continuous trading is taken as the official close. Bombay Stock Exchange prices are only used for securities not traded on the NSE.	3:30PM

## MSCI Index Calculation Methodologies

India	National Stock Exchange of India	.NS	IS	XNSE	VWAP	The closing price of a security is the volume weighted average price of the last half hour (3:00PM-3:30PM). If there are no trades during the last 30 minutes, then the last traded price is taken as the official close. However, in cases where such prices are not available due to the delisting from the National Stock Exchange (NSE), official closing prices from the Bombay Stock Exchange will be used.	4:00PM
Indonesia	Jakarta Stock Exchange	.JK	IJ	XIDX	Last traded price	Last traded price	4:00PM
Ireland	Irish Stock Exchange	.I	ID	XDUB	Auction close	The session ends with a 2 minute auction (between 4:28PM and 4:30PM). If a security is traded during the closing auction, the auction price will be the official closing price. If there are trades during the opening auction or during the continuous trading period, but no trades during the closing auction, the last traded price will be the official closing price. If there are no trades on a particular day, the previous day's official closing price will be the official closing price.	5.05PM
Israel	Tel Aviv Stock Exchange	.TA	IT	XTAE	Auction Close	The closing price will be the one set during the closing call alone, where the volume of the share at the closing call auction will be at least: NIS 400,000 in the TA-25 NIS 200,000 in the TA-75 NIS 100,000 in the "Mid Cap" index. If the closing volume is less than mentioned above, the price will be set at the weighted average of the latest transaction prices, including those executed in the closing call.	4:30PM
Italy	Italian Stock Exchange	.MI	IM	MTAA	Auction close	The closing auction, including a pre-auction phase that can end at any time within the last minutes of that actual pre-auction phase. Closing auction, comprising the closing phases and validation, will end at 5:40PM local time. Where no auction price is available, the reference price, defined by the exchange as the Volume Weighted average of the last 10% of the day's trading volume, will be used.	5:40PM
Jamaica	Jamaica Stock Exchange	.JM	JA	XJAM	Average price	The Average Price calculation is the volumes of a stock purchased at different prices, divided by the cumulative volumes of the stock unit that traded throughout the day.	1:30PM
Japan	Nagoya Stock Exchange	.NG	JN	XNGO	Auction close	The closing price is determined during a price auction which takes place at the end of the normal trading day. During this auction, all orders entered in the individual order book are aggregated before the execution, and treated as simultaneous orders. In accordance with the principle of price priority, each buy order is compared with sell orders until its volume and price are matched. By this method, a single price is determined and this price makes up the closing price. In the event of a closing auction not happening for a particular day, the last price (Itayose or special quote method) will be used instead.	3:30PM
Japan	Osaka Securities Exchange	.OS	JO	XOSE	Auction close	The closing price is determined during a price auction which takes place at the end of the normal trading day. During this auction, all orders entered in the individual order book are aggregated before the execution, and treated as simultaneous orders. In accordance with the principle of price priority, each buy order is compared with sell orders until its volume and price are matched. By this method, a single price is determined and this price makes up the closing price. In the event of a closing auction not happening for a particular day, the last price (Itayose or special quote method) will be used instead.	3:10PM

## MSCI Index Calculation Methodologies

Japan	Tokyo Stock Exchange	.T	JT	XTKS	Auction close	The closing price is determined during a price auction which takes place at the end of the normal trading day. During this auction, all orders entered in the individual order book are aggregated before the execution, and treated as simultaneous orders. In accordance with the principle of price priority, each buy order is compared with sell orders until its volume and price are matched. By this method, a single price is determined and this price makes up the closing price. In the event of a closing auction not happening for a particular day, the last price (Itayose or special quote method) will be used instead.	3:00PM
Japan	JASDAQ	.Q	JQ	XJAS	Auction close	The closing price is determined during a price auction which takes place at the end of the normal trading day. During this auction, all orders entered in the individual order book are aggregated before the execution, and treated as simultaneous orders. In accordance with the principle of price priority, each buy order is compared with sell orders until its volume and price are matched. By this method, a single price is determined and this price makes up the closing price. In the event of a closing auction not happening for a particular day, the last price (Itayose or special quote method) will be used instead.	3:00PM
Jordan	Amman Stock Exchange	.AM	JR	XAMM	Last traded price	Last traded price	12:00PM
Kazakhstan	Kazakhstan Stock Exchange	.KZ	KZ	XKAZ	Last traded price	Last traded price	6:00PM
Kazakhstan (UK listed Depository Receipts)	London Stock Exchange	.L	LI	XLON	see UK (SETS)	see UK (SETS)	see UK (SETS)
Kenya	Nairobi Stock Exchange	.NR	KN	XNAI	VWAP	The closing price of a security shall be the Volume Weighted Average Price (VWAP) or transactions executed during the last hour of trading of the specific security. If the security does not trade within the last hour the closing price will be the average price calculated for the session.	3:00PM
Korea	KSE	.KS	KP	XKRX	Auction close	The closing price is the price for which the highest number of orders can be executed during the auction. The auction starts 10 minutes before the official close at 3:00PM.	3:00PM
Korea	KOSDAQ	.KQ	KQ	XKOS	Auction close	The closing price is the price for which the highest number of orders can be executed during the auction. The auction starts 10 minutes before the official close at 3:00PM.	3:00PM
Kuwait	Kuwait Stock Exchange	.KW	KK	XKUW	Last traded price	Last traded price	12:30PM
Lebanon	Beirut Stock Exchange	.BY	LB	XBEY	Last traded price	Last traded price	12:30PM
Lithuania	Vilnius Stock Exchange	.VL	LH	XLIT	Closing Call Auction	In the course of the closing auction, transaction orders are matched in the order book according to the equilibrium price. The equilibrium price is calculated to be the price where in a particular Order Book the highest buy price is higher than or equal to the lowest sell price.	2:30PM

## MSCI Index Calculation Methodologies

Malaysia	The Bursa Malaysia Berhad	.KL	MK	XKLS	Last traded price	Last traded price	5:00PM
Mauritius	The Stock Exchange of Mauritius	.MZ	MP	XMAU	Last traded price	Last traded price	12:30PM
Mexico	Bolsa Mexicana de Valores	.MX	MM	XMEX	Weighted average price	Weighted Average Price of the last 20 minutes of trading	3:00PM
Morocco	Bourse De Casablanca	.CS	MC	XCAS	Last traded price	Last traded price	3:30PM
Netherlands	EuroNext Amsterdam	.AS	NA	XAMS	Auction price	The closing price is an auction price calculated between 5:30PM and 5:35PM. It is still possible to trade at the auction price between 5:30PM and 5:40PM.	5:35PM
New Zealand	New Zealand Exchange Limited	.NZ	NZ	XNZE	Last traded price	Last traded price	5:00PM
Nigeria	Nigeria Stock Exchange	.LG	NL	XNSA	Last traded price	Last traded price	1:30PM
Norway	Oslo Stock Exchange	.OL	NO	XOSL	Auction close	The official closing prices is determined during a closing auction which takes place at the end of the continuous trading between 16:20 and 16:30. When the closing auction for a particular security cannot be completed, the last traded price before the start of the auction will be used.	5:30PM
Oman	Oman Muscat Exchange	.OM	OM	XMUS	VWAP	The closing price is considered to be the volume weighted average price. The closing price will not change unless a minimum number of securities are traded. This minimum is 500 Shares for securities listed in the Regular & Parallel markets and 2000 for securities listed in the Third market. In case traded securities do not exceed the specified threshold for their market, the closing price will equal the previous close.	1:00PM
Pakistan	Karachi Stock Exchange	.KA	PK	XKAR	Official Close	The closing price is determined by the volume weighted average price of the last 30 minutes trades of that security for the day. In case of no trading in a particular security during the last 30 minutes of the day, the closing price is the volume weighted average price for the last traded 30 minutes of that security.	2:15PM (Mon-Thu), 4:00PM (Fri)
Peru	Bolsa De Valores de Lima	.LM	PE	XLIM	Last traded price	Last round lot regular trade	4:00PM
Peru (US listed Depository Receipts)	NYSE	.N	UN	XNYS	see USA (NYSE)	see USA (NYSE)	see USA (NYSE)
Philippines	Philippine Stock Exchange	.PS	PM	XPHS	Last traded price	Last traded price	12:10PM
Poland	Warsaw Stock Exchange	.WA	PW	XWAR	Auction Close	The closing price is determined in an auction procedure in which the closing price will be based on orders submitted during the closing phase. If no orders are placed during the closing phase then the closing price will be that of the last transaction.	4:30PM

## MSCI Index Calculation Methodologies

Portugal	EuroNext Lisbon	.LS	PL	XLIS	Auction close	The closing price is an auction price calculated between 4:30PM and 4:35PM. It is still possible to trade at the auction price between 4:30PM and 4:40PM.	4:35PM
Qatar	Doha Securities Market	.QA	QD	DSMD	VWAP	The closing price is calculated electronically and is the value weighted average of the stock price with a 5% limit of price fluctuation up and down.	12:30PM
Romania	Bucharest Stock Exchange	.BX	RO	XBSE	Last traded price	Last Traded Price	4:30PM
Russia	Russian Trading System (RTS)	.RTS	RR	RTSX	Last traded price	Last traded price	6:00PM
Russia	Moscow Interbank Currency Exchange (MICEX)	.MM	RX	XMIC	Last traded price	Last traded price	6:45PM
Russia (US listed Depository Receipts)	New York Stock Exchange	.N	UN	XNYS	see USA (NYSE)	see USA (NYSE)	see USA (NYSE)
Russia (UK listed Depository Receipts)	London Stock Exchange	.L	LI	XLON	see UK (SETS)	see UK (SETS)	see UK (SETS)
Saudi Arabia	Saudi SE (Tadawul)	.SE	AB	XSAU	Last traded price	The official closing price will be the same as the last traded price if the turnover (value) of the last trade is greater than or equal to 15,000 Saudi Riyal. Otherwise, the official close will be equal to the price from its immediate previous trade that has turnover (value) greater than or equal to 15,000 Saudi Riyal from that particular day's trading. If there is no trade on the current day with a value greater than or equal to 15,000 Saudi Riyal, the current day's official closing price will be equal to the previous day's official closing price.	3:30PM
Serbia	Belgrade SE	.BEL	SG	XBEL	VWAP	The closing price is considered to be the volume weighted average price.	2:00PM
Singapore	Singapore Exchange Securities Trading	.SI	SP	XSES	Auction close	At 5:00PM, all unmatched orders are carried forward to Pre-Close Routine, which runs for 6 minutes and consists of a Pre-Close Period and a Non-Cancel Period. Similarly, orders can be entered, amended or cancelled during the Pre-Close Period (5:00PM - 5:05PM). During the Non-Cancel Period (5:05PM - 5:06PM), orders are matched and executed at a Closing price computed for the day, while unmatched orders will become void.	5:06PM
Slovenia	Ljubljana Stock Exchange	.LJ	SV	XLJU	VWAP	Weighted Average Price of trades in the last 30 mins, If no trades during last 30 mins, last trade is taken	1:00PM
South Africa	Johannesburg Stock Exchange	.J	SJ	XJSE	Last traded price / VWAP	The closing prices on securities traded on the South Africa Exchange will be calculated based on the price at which trades occurred in a closing execution. In this closing execution, the last traded price will be the official closing price, unless there is a higher	5:05PM

## MSCI Index Calculation Methodologies

						bid price or a lower ask offer, which will then be used as the closing price. In the event that there is no closing execution, then a Volume Weighted Average Price (VWAP) taken over the last 10 minutes of trading leading up to the "closing auction" is used.	
Spain	Mercado Continuo CATS	.MC	SQ	XMCE	Auction price	The session ends with a 5 minute auction (between 5:30PM and 5:35PM) and a random closing of 30 seconds. The resulting auction price will be the session's Closing price. In case an Auction price does not exist, the closing price will be the price of the last 500 traded units closest to their weighted average. If two prices have the same difference with respect to this weighted price, the price will be the last one executed. If 500 units have not been traded, the closing price will be the price of the previous session.	5:35PM
Sri Lanka	Colombo Stock Exchange	.CM	SL	XCOL	VWAP	Closing price is defined as the Volume Weighted Average Price (VWAP) of trades executed during the last one hour of trading of the specific security. If the security does not trade during such one hour the closing price will be the VWAP calculated for the period of time it has traded.	2:30PM
Sweden	Stockholm Stock Exchange	.ST	SS	XSTO	Auction price	The official closing price is the result of the closing call which occurs during the last 10 minutes of trading. If no trades are matched in the closing call then the last trade prior to the auction will be defined as the closing price.	5:30PM
Switzerland	The Swiss Exchange (SWX)	.S	SE	XSWX	Auction price	Closing price is the result of the closing auction (the auction pre-opening starting at 5:20PM, and the auction being run at 5:30PM). If no price update occurs during that auction, the last paid price on the exchange will represent the reference price. If there is no paid price for the given security that day, the reference price will be calculated by either taking the bid-price, if the bid is higher than the reference price, or it will take the ask-price if the ask is lower than the reference price.	5:30PM
	Virt-X	.VX	VX	XVTX			
Taiwan	Taiwan Stock Exchange	.TW	TT	XTAI	Auction price	The closing price is determined by a closing call auction. The Exchange will accumulate orders for 5 minutes (from 1:25 p.m. to 1:30 p.m.) before the closing call auction. If there is no closing auction for a security, the last traded price will be used.	1:30PM
Thailand	The Stock Exchange Of Thailand	.BK	TB	XBKK	Auction price	The closing price is defined by using the random call auction method. The closing auction can take place anytime between 4:35PM and 4:40PM local time. This method apply to securities trade on both main board and foreign board of stock exchange of Thailand.	4:40PM
Trinidad and Tobago	Trinidad and Tobago Stock Exchange	.JM	TP	XTRN	Official Close	The closing price of a security listed on the Exchange is determined by using the price of the last transaction executed in the primary market for the security, subject to the Board Lot structure below. By way of example, for a share priced between \$0 - \$4.00, the last transaction executed with a volume of 5,000 shares or more, would be the closing price used. If a security does not trade in any designated trading session, the closing price of that security will be the same as the closing price of the previous day.	12:00PM
Tunisia	Tunis Stock Exchange	.TN	TU	XTUN	Last Trade	Last traded price	11:30AM
Turkey	Istanbul Stock Exchange	.IS	TI	XIST	Last traded price	Last traded price	5:00PM
Ukraine	PFTS	.PFT	UZ	PFTS	Last traded price	Last traded price	5:00PM
United Arab	Abu Dhabi Securities	.AD	DH	XADS	VWAP	The closing price is the value weighted average of the stock price for the day. There is	2:00PM

## MSCI Index Calculation Methodologies

Emirates	Market					currently no minimum volume restriction.	
United Arab Emirates	Dubai Stock Exchange	.DU	DB	XDFM	Last traded price	Last traded price	2:00PM
United Arab Emirates	Dubai International Financial Exchange	.DI	DU	DIFX	Last traded price	Last traded price	5:00PM
United Kingdom	London Stock Exchange	.L	LN	XLON	Auction price	For SETS, the closing trade price is the uncrossing trade price at which orders execute during an auction, or a Volume Weighted Average Price (VWAP), or the last automatic trade price. If a closing auction fails to take place, then the VWAP of the last 10 minutes of trading will be used to set the closing price. If however, no trading has occurred during the VWAP period, then the last automatic trade price will be used as the official closing price.	4:35PM
United Kingdom	London Stock Exchange	.L	LN	XLON	Mid price	For SEAQ, SEATS and AIM securities the closing price is the mid price of the best bid and best offer calculated from market maker quotes at the end of the mandatory quote period.	4:35PM
USA	NASDAQ Capital Market	.OQ	UR	XNCM	NOCP	The NOCP is either determined using the normalized price of the last trade reported to NASDAQ's proprietary trade reporting system or, for selected securities, using the newly introduced NASDAQ Closing Cross. The normalized NASDAQ Official Closing Price (NOCP) adjusts reported trade price outside the closing bid-ask spread, "moving up" to the bid whenever the last sale is below the bid or "moving down" to the ask whenever the last sale is above the ask.	4:02PM
USA	NASDAQ Global Market	.OQ	UQ	XNAS	NOCP	The NOCP is either determined using the normalized price of the last trade reported to NASDAQ's proprietary trade reporting system or, for selected securities, using the newly introduced NASDAQ Closing Cross. The normalized NASDAQ Official Closing Price (NOCP) adjusts reported trade price outside the closing bid-ask spread, "moving up" to the bid whenever the last sale is below the bid or "moving down" to the ask whenever the last sale is above the ask.	4:02PM
USA	NASDAQ Global Select Market	.OQ	UW	XNGS	NOCP	The NOCP is either determined using the normalized price of the last trade reported to NASDAQ's proprietary trade reporting system or, for selected securities, using the newly introduced NASDAQ Closing Cross. The normalized NASDAQ Official Closing Price (NOCP) adjusts reported trade price outside the closing bid-ask spread, "moving up" to the bid whenever the last sale is below the bid or "moving down" to the ask whenever the last sale is above the ask.	4:02PM
USA	NYSE	.N	UN	XNYS	Last traded price	Last traded price	4:00PM
USA	AMEX	.A	UA	XASE	Last traded price	Last traded price	4:00PM
Vietnam	Ho Chi Minh Securities Trading Center	.HN	VM	XSTC	Last traded price	Last traded price	11:00AM

Vietnam	Hanoi Securities Trading Center	.HM	VH	HSTC	Last traded price	Last traded price	11:00AM
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\* Refers to price availability times during DST period in the US.

Prices availability shown in this table refers to the time prices are normally available. It considers changes due to DST periods but no other factors such as Ramadan period, changes in opening hours on a day prior a holiday, etc.

Special note for countries open on Saturday and/or Sunday:

In the event that a security does not trade on a Monday but was traded on the previous Saturday and/or Sunday, the latest price available during the weekend will be used for the Monday index calculation.

In addition, a security that does not trade on Monday but traded ex corporate event during the previous weekend will have the event reflected in the Monday index calculation.



## Appendix VIII: Country Composition of MSCI Selected Regional Indices

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
903200	ARGENTINA	1-Jan-1988 to 29-May- 2009	1-Jan-1988 to 29-May- 2009	-	-	-	-	-	-	1-Jan-1988 to 29-May- 2009	-	-	1-Jun-2009
903600	AUSTRALIA	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	-	-	-	1-Jan-1988	-	-	-	-
904000	AUSTRIA	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	1-Jan-1988	1-Jan-1988	-	-	-	-	-
133712	BAHRAIN	-	-	-	-	-	-	-	-	-	1-Jun- 2005	1-Jun-2005	3-Jun-2002
700396	BANGLADESH	-	-	-	-	-	-	-	-	-	-	-	27-May-2010
905600	BELGIUM	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	1-Jan-1988	1-Jan-1988	-	-	-	-	-
700074	BOTSWANA	-	-	-	-	-	-	-	-	-	-	-	-
907600	BRAZIL	1-Jan-1988	1-Jan-1988	-	-	-	-	-	-	1-Jan-1988	-	-	-
106576	BRAZIL FORMER	-	-	-	-	-	-	-	-	-	-	-	-
136634	BULGARIA	-	-	-	-	-	-	-	-	-	-	-	1-Jun-2005
912400	CANADA (3)	1-Jan-1988	-	1-Jan-1970	-	-	-	-	-	1-Jan-1988	-	-	-

## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
915200	CHILE	1-Jan-1988	1-Jan-1988	-	-	-	-	-	-	1-Jan-1988	-	-	-
302400	CHINA	3-Sep-1996	3-Sep-1996	-	-	-	-	-	3-Sep-1996	-	-	-	-
917000	COLOMBIA	2-Feb-1994	2-Feb-1994	-	-	-	-	-	-	2-Feb-1994	-	-	-
136635	CROATIA	-	-	-	-	-	-	-	-	-	-	-	3-Jun-2002
920000	CZECH REPUBLIC	3-Sep-1996	3-Sep-1996	-	-	-	-	3-Sep-1996	-	-	-	-	-
920800	DENMARK	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	-	1-Jan-1988	-	-	-	-	-
105766	EGYPT	1-Jun-2001	1-Jun-2001	-	-	-	-	-	-	-	-	1-Jun-2005	-
136636	ESTONIA	-	-	-	-	-	-	-	-	-	-	-	3-Jun-2002
924600	FINLAND	18-Jan-1993	-	1-Jan-1988	1-Jan-1988	1-Jan-1988	1-Jan-1988	1-Jan-1988	-	-	-	-	-
824600	FINLAND FREE	1-Jan-1988 to 17-Jan- 1993	-	-	-	-	-	-	-	-	-	-	-
925000	FRANCE	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	1-Jan-1988	1-Jan-1988	-	-	-	-	-
928000	GERMANY	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	1-Jan-1988	1-Jan-1988	-	-	-	-	-
700073	GHANA	-	-	-	-	-	-	-	-	-	-	-	-

## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
930000	GREECE	1-Jan-1988	1-Jan-1988 to 31-May- 2001	1-Jun-2001	1-Jun-2001	1-Jun- 2001	1-Jun-2001	1-Jan-1988	-	-	-	-	-
934400	HONG KONG	1-Jan-1988	-	1-Dec-1972	1-Dec-1972	-	-	-	1-Jan-1988	-	-	-	-
934800	HUNGARY	3-Sep-1996	3-Sep-1996	-	-	-	-	3-Sep-1996	-	-	-	-	-
935600	INDIA	2-Feb-1994	2-Feb-1994	-	-	-	-	-	2-Feb-1994	-	-	-	-
936000	INDONESIA FORMER	1-Sep-1989 to 1-Jun- 1997	1-Sep-1989 to 1-Jun- 1997	-	-	-	-	-	1-Sep-1989 to 1-Jun- 1997	-	-	-	-
105767	INDONESIA	2-Jun-1997	2-Jun-1997	-	-	-	-	-	2-Jun-1997	-	-	-	-
937200	IRELAND (2)	1-Jan-1988	-	3-May-1993	3-May-1993	3-May- 1993	3-May-1993	1-Jan-1988	-	-	-	-	-
300400	ISRAEL	2-Feb-1994	2-Mar-1995 to 26-May- 2010	27-May-2010	27-May- 2010	-	-	2-Mar-1995	-	-	-	-	-
938000	ITALY	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	1-Jan-1988	1-Jan-1988	-	-	-	-	-

## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
700071	JAMAICA	-	-	-	-	-	-	-	-	-	-	-	-
939200	JAPAN	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	-	-	-	1-Jan-1988	-	-	-	-
940000	JORDAN	1-Jan-1988 to 25-Nov- 2008	1-Jan-1988 to 25-Nov- 2008	-	-	-	-	1-Jan-1988 to 25-Nov-2008	-	-	-	1-Jun-2005	26-Nov-2008
136637	KAZAKHSTAN	-	-	-	-	-	-	-	-	-	-	-	1-Dec-2005
136643	KENYA	-	-	-	-	-	-	-	-	-	-	-	3-Jun-2002
941000	KOREA	1-Sep-1998	1-Sep-1998	-	-	-	-	-	1-Sep-1998	-	-	-	-
841000	KOREA (FORMER) (7)	7-Jan-1992 to 31-Aug- 1998	7-Jan-1992 to 31-Aug- 1998	-	-	-	-	-	7-Jan-1992 to 31-Aug- 1998	-	-	-	-
133713	KUWAIT	-	-	-	-	-	-	-	-	-	1-Jun- 2005	1-Jun-2005	3-Jun-2002
136642	LEBANON	-	-	-	-	-	-	-	-	-	-	2-Jun-2008	3-Jun-2002
136638	LITHUANIA	-	-	-	-	-	-	-	-	-	-	-	26-Nov-2008

## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
944200	LUXEMBOURG (2)	1-Jan-1988 to 30-Sep- 1996	-	-	-	-	-	1-Jan-1988 to 30-Sep-1996	-	-	-	-	-
105768	MALAYSIA	2-Jun-1997 to 30-Nov- 1998 & 1- Jun-2000	2-Jun-1997 to 30-Nov- 1998 & 1- Jun-2000	-	-	-	-	-	2-Jun-1997 to 30-Nov- 1998 & 1- Jun-2000	-	-	-	-
945800	MALAYSIA FORMER	1-Jan-1988 to 1-Jun- 1997	1-Jan-1988 to 1-Jun- 1997	3-May-1993 to 30-Sep-98	3-May-1993 to 30-Sep- 98	-	-	-	1-Jan-1988 to 1-Jun- 1997	-	-	-	-
136644	MAURITIUS	-	-	-	-	-	-	-	-	-	-	-	3-Jun-2002
848400	MEXICO	1-Jan-1988	1-Jan-1988	-	-	-	-	-	-	1-Jan-1988	-	-	-
948400	MEXICO FORMER	-	-	5-Nov-1981 to 31-Dec-1987	-	-	-	-	-	-	-	-	-
105765	MOROCCO	1-Jun-2001	1-Jun-2001	-	-	-	-	-	-	-	-	1-Jun-2005	-
952800	NETHERLANDS	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	1-Jan-1988	1-Jan-1988	-	-	-	-	-

## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
955400	NEW ZEALAND	1-Jan-1988	-	1-Jan-1988	1-Jan-1988	-	-	-	1-Jan-1988	-	-	-	-
136645	NIGERIA	-	-	-	-	-	-	-	-	-	-	-	3-Jun-2002
957800	NORWAY	1-Feb-1995	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	-	1-Jan-1988	-	-	-	-	-
857800	NORWAY FREE (5)	1-Jan-1988 to 31-Jan- 1995	-	-	-	-	-	-	-	-	-	-	-
133714	OMAN	-	-	-	-	-	-	-	-	-	1-Jun- 2005	1-Jun-2005	3-Jun-2002
958600	PAKISTAN	2-Feb-1994 to 31-Dec- 2008	2-Feb-1994 to 31-Dec- 2008	-	-	-	-	-	2-Feb-1994 to 31-Dec- 2008	-	-	-	1-Jun-2009
960400	PERU	2-Feb-1994	2-Feb-1994	-	-	-	-	-	-	2-Feb-1994	-	-	-
860800	PHILIPPINES	1-Jan-1988	1-Jan-1988	-	-	-	-	-	1-Jan-1988	-	-	-	-
960800	PHILIPPINES FORMER	-	-	-	-	-	-	-	-	-	-	-	-
961600	POLAND	2-Mar-1995	2-Mar-1995	-	-	-	-	2-Mar-1995	-	-	-	-	-

## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
962000	PORTUGAL	1-Jan-1988	1-Jan-1988 to 30-Nov- 1997	01-Dec-1997	01-Dec- 1997	01-Dec- 1997	01-Dec- 1997	1-Jan-1988	-	-	-	-	-
133715	QATAR	-	-	-	-	-	-	-	-	-	1-Jun- 2005	1-Jun-2005	3-Jun-2002
136639	ROMANIA	-	-	-	-	-	-	-	-	-	-	-	1-Dec-2005
105653	RUSSIA	01-Dec- 1997	01-Dec- 1997	-	-	-	-	01-Dec-1997	-	-	-	-	-
133716	SAUDI ARABIA	-	-	-	-	-	-	-	-	-	1-Jun- 2005	1-Jun-2005	-
141415	SERBIA	-	-	-	-	-	-	-	-	-	-	-	26-Nov-2008
998100	SINGAPORE (SINGAPORE/MALAYSIA)	1-Dec-1999	-	01-Dec-1972	01-Dec- 1972	-	-	-	1-Dec-1999	-	-	-	-
970200	SINGAPORE (FORMER)	1-Jan-1988 to 30-Apr- 1993	-	-	-	-	-	-	1-Jan-1988 to 30-Apr- 1993	-	-	-	-

## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
870200	SINGAPORE FREE (4) (6)	3-May-1993 to 30-Nov- 1999	-	-	-	-	-	-	3-May-1993 to 30-Nov- 1999	-	-	-	-
136640	SLOVENIA	-	-	-	-	-	-	-	-	-	-	-	3-Jun-2002
971000	SOUTH AFRICA	2-Mar-1995	2-Mar-1995	-	-	-	-	-	-	-	-	-	-
998000	SOUTH AFRICAN GOLD MINES (1)	1-Jan-1988 to 1-Mar- 1995	-	2-Dec-1974 to 1-Mar-1995	-	-	-	-	-	-	-	-	-
972400	SPAIN	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	1-Jan-1988	1-Jan-1988	-	-	-	-	-
914400	SRI LANKA	2-Feb-1994 to 31-May- 2001	2-Feb-1994 to 31-May- 2001	-	-	-	-	-	2-Feb-1994 to 31-May- 2001	-	-	-	1-Dec-2003
975200	SWEDEN	18-Jan-1993	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	-	1-Jan-1988	-	-	-	-	-
875200	SWEDEN FREE	1-Jan-1988 to 17-Jan- 1993	-	-	-	-	-	-	-	-	-	-	-



## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
975600	SWITZERLAND	16-Jul-1992	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	-	1-Jan-1988	-	-	-	-	-
875600	SWITZERLAND FREE	1-Jan-1988 to 15-Jul- 1992	-	-	-	-	-	-	-	-	-	-	-
915800	TAIWAN	3-Jun-2002	3-Jun-2002	-	-	-	-	-	3-Jun-2002	-	-	-	-
815800	TAIWAN FORMER (8)	3-Sep-1996 to 2-Jun- 2002	3-Sep-1996 to 2-Jun- 2002	-	-	-	-	-	3-Sep-1996 to 2-Jun- 2002	-	-	-	-
976400	THAILAND FORMER	1-Jan-1988 to 1-Jun- 1997	1-Jan-1988 to 1-Jun- 1997	-	-	-	-	-	1-Jan-1988 to 1-Jun- 1997	-	-	-	-
105769	THAILAND	2-Jun-1997	2-Jun-1997	-	-	-	-	-	2-Jun-1997	-	-	-	-
700072	TRINIDAD AND TOBAGO	-	-	-	-	-	-	-	-	-	-	-	1-Jun-2009
136646	TUNISIA	-	-	-	-	-	-	-	-	-	-	2-Jun-2008	1-Jun-2004
979200	TURKEY	1-Sep-1989	1-Sep-1989	-	-	-	-	1-Oct-1996	-	-	-	-	-
136641	UKRAINE	-	-	-	-	-	-	-	-	-	-	-	1-Jun-2006

## MSCI Index Calculation Methodologies

MSCI CODE	INDEX NAME	892400 ACWI (former ACWIF)	891800 EM (former EMF)	990100 THE WORLD INDEX (3)	990300 EAFE	990500 EUROPE	106400 EMU	302200 AC EUROPE & MIDDLE EAST	302000 AC ASIA PACIFIC	899902 AC AMERICAS	133709 GCC COUNTRIES	133707 ARABIAN MARKETS	136614 FM (FRONTIER MARKETS)
133717	UNITED ARAB EMIRATES	-	-	-	-	-	-	-	-	-	1-Jun-2005	1-Jun-2005	3-Jun-2002
982600	UNITED KINGDOM	1-Jan-1988	-	1-Jan-1970	1-Jan-1970	1-Jan-1970	-	1-Jan-1988	-	-	-	-	-
984000	USA (3)	1-Jan-1988	-	1-Jan-1970	-	-	-	-	-	1-Jan-1988	-	-	-
886200	VENEZUELA	2-Feb-1994 to 31-May-2006	2-Feb-1994 to 31-May-2006	-	-	-	-	-	-	2-Feb-1994 to 31-May-2006	-	-	-
986200	VENEZUELA (FORMER)	-	-	-	-	-	-	-	-	-	-	-	-
136647	VIETNAM	-	-	-	-	-	-	-	-	-	-	-	1-Dec-2006

### Notes

- (1) Excluded from all dividends reinvested indices
- (2) Luxembourg has been excluded from dividend reinvested indices since 01-Jan-1993 and Ireland prior to 03-May-1993
- (3) Until 29-Nov-1974, the World Index was a weighted arithmetic average of the MSCI EAFE, of the NYSE and the TSE Indices
- (4) Included in Far East Free, Pacific Free and Pacific Free ex Japan since 1-Jan-1988

Those indices were back-calculated until 1-Jan-1988 in 2003 when Singapore Free was launched

- (5) Restrictions appeared since 1-Dec-1989
- (6) No more foreign quotation since 1-Dec-1999  
Prices taken from the foreign board between 4-May-1988 and 30-Nov-1999
- (7) Korea was included in the free indices at 20% of its market cap between 7-Jan-92 and 2-Sep-96 and at 50% between 3-Sep-96 and 31-Aug-98
- (8) Taiwan was included in the free indices at 50% of its market cap between 3-Sep-96 and 31-May-00, at 65% between 1-Jun-00 and 30-Nov-00 and at 80% between 1-Dec-00 and 2-Dec-01

## Appendix IX: MSCI Real Time Indices

MSCI currently calculates price, net and gross variants for approximately 9,000 equity based indices in real time as well as the FX Hedge, Currency, Short/Leveraged and Daily Hedged indices. All MSCI Real Time Indices are calculated based on the corresponding end-of-day index calculation methodologies.

MSCI disseminates real time indices every 60 seconds or 15 seconds depending on the index type and its use in the marketplace. On a daily basis for each real time index, MSCI will provide an Index Open value **(IO)** which will occur when the first security belonging to that index trades, an Index Update value **(IU)** which will occur throughout the day after the Index Open has been sent and an Index Close value **(IC)** which will be sent out as the last real time level and indicate the real time closing value.<sup>1</sup>

### Real Time Intraday Foreign Exchange Rates vs. Real Time Close Foreign Exchange Rates

MSCI Real Time Indices use the Reuters Multi Contributor FX Rates for all Index Open and Index Updates and MSCI applies the WM 4PM London time Closing Mid Rates for the Index Close.

Mono-currency indices which are indices that have exposure to a single currency will have their Index Close value sent shortly after the underlying stock exchange(s) close and do not require the WM 4PM London closing rate to calculate the Index Close.

Multi-currency indices (which have exposure to multiple currencies) require the WM 4PM London closing rate to calculate the Index Close. Multi-currency indices whose underlying stock exchanges close before the WM 4PM London rates are received will have their last Index Update sent shortly after the last underlying stock exchange closes and then will have their Index Close sent when the WM 4PM London Close is received. Multi-currency indices whose underlying stock exchanges close after the WM 4PM London rates are received will continue to use the Reuters Multi Contributor FX rates for all Index Updates until the last underlying stock exchange closes and the Index Close is sent using the WM 4PM London Close.

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<sup>1</sup> The real time Index Close could be different from the index value for the same index delivered in MSCI's end-of-day product files due to manual data updates implemented during the end-of-day calculation process. The official closing level of any MSCI index is the level distributed in MSCI's end-of-day product files.

### Real Time Intraday Security Pricing vs. Real Time Close Security Pricing

Index Open and Index Update calculations use the last traded price available and the Index Close uses the official closing price or last trade as described in the MSCI Closing Prices Policy found in Appendix VII of this document.

### Price filtering

MSCI has various price filters set in place to ensure that high quality prices are used in MSCI's Real Time index calculations. MSCI's price market filters exclude trades such as block sales and odd lots among others and MSCI's price threshold filters ensure that price fluctuations above or below a certain threshold are checked prior to being included in the calculation of the MSCI Real Time Indices.

### Real Time Cash Dividend Reinvestment

Consistent with the Daily Total Return (DTR) end-of-day index calculation methodology, MSCI's real time DTR calculation will reinvest a dividend only if the security paying the dividend trades on the ex-date. The dividend will be reflected in real time index calculations as soon as the security paying the dividend trades in real time. All dividends for which the security does not trade on the ex-date will be postponed to the next day. Late and correction dividends will be treated in real time calculations consistent with the end-of-day DTR index calculation methodology. For more details on MSCI's DTR methodology please see the discussion beginning on page 21 of this document.

### General Announcement Policy for Dividends

Upcoming dividends to be reinvested in the MSCI DTR Indices are announced prior to their reinvestment in the MSCI Security Advanced Dividend File.

Late dividends and dividend corrections that are received after their ex-date are reinvested or corrected in the MSCI DTR Indices on the next business day following the reception date from the data sources. Therefore, there is at least one day's notice through the MSCI Security Advanced Dividend File prior to their reinvestment and / or correction.

In exceptional cases, MSCI will announce the treatment of dividends that are not pre-announced in the MSCI Security Advanced Dividend File and are received by MSCI during market hours on their ex-date

through an intraday option email announcement.

### **Intraday Price Adjustment Factor (PAF) Announcements**

MSCI sends an Opening and Closing PAF announcement for all Real Time constituents that have a corporate event effective involving the calculation of a theo-cum PAF such as a special cash dividend, capital repayment or in general when a shareholder receives something other than the underlying asset.

The opening PAF announcement uses the opening price of the security and is used for Index Update calculations throughout the day. The opening PAF value is sent shortly after the first trade of the security having the corporate event and does not change throughout the day based on intraday market prices.

The closing PAF announcement uses the closing price of the security having the corporate event and is used in the Index Close calculation. The closing PAF value is sent shortly after the closing price of the security having the corporate event is received. For more information on corporate events, please see the MSCI Corporate Event Methodology document.

## MSCI Index Calculation Methodology Book Tracked Changes

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The following sections and appendix have been updated since January 2008.

### 2008

#### February:

- **Daily Hedged Indices**
  - Change in the wording to clarify the hedged indices calculation methodology (3.2.1 and 3.2.2)
  - Update of the Daily Hedged Index example (3.2.5)
- **Appendix VI: Withholding Tax Rates**
  - Addition of Frontier Markets
  - Removal of Venezuela
- **Appendix VII: Closing Prices Policy**
  - Addition of Frontier Markets
  - Removal of Venezuela
- **Appendix VIII: Country Composition of MSCI Regional Indices**
  - Addition of Frontier Markets countries
  - Addition of 3 regions (GCC countries, Arabian Markets, Frontier Markets)

#### March:

- **Appendix VII: Closing Prices Policy**
  - Change in the closing price description for Croatia
  - Addition of Dubai International Financial Exchange for United Arab Emirates

#### April:

- **Appendix VII: Closing Prices Policy**
  - Change in the closing price description for Croatia
  - Addition of Dubai International Financial Exchange for United Arab Emirates

#### May:

- **Appendix VII: Closing Prices Policy**
  - Change in the closing price description for Israel (Domestic).
  - Change in the Closing price available time (local) of Bahrain market

- Change in the Closing price used, price description and available time for HK.

## July:

- **Appendix II: Security level information: Annualized Traded Value Ratio (ATVR) and Annual Traded Value**
  - New section

## September:

- **Appendix VII: Closing Prices Policy**
  - Closing prices available at 5:30pm local time for Norway (Oslo Stock Exchange).
  - Include Serbia and Belgrade Stock Exchange trading information.

## November:

- **Appendix VI: Withholding Taxes Rates**
  - Addition of Lithuania and Serbia
- **Appendix VII: Closing Prices Policy**
  - Closing price availability for Greece updated to be 5:20pm local time.
  - Closing price used for Serbia market updated to be VWAP.
  - Closing price used for Chile market updated to be Official Closing Price.
- **Appendix VIII: Country Composition of MSCI Regional Indices**
  - Addition of Lithuania and Serbia.
  - Updates for Jordan

## December:

- **Appendix VII: Closing Prices Policy**
  - Closing price description of Thailand includes explanation of applying random auction call method to both main board and foreign board of stock exchange of Thailand.
  - Price used for The Bombay Stock Exchange update to be WAP, description is also updated accordingly.
  - Closing price description of The National Stock Exchange of India has been confirmed to be Volume Weighted Average Price.



- Closing price used and description for Pakistan will take last available ASK price for those securities that do not report one or more trades on the Karachi Stock Exchange for the calculation date.
  - Include coverage of Botswana, Ghana, Jamaica and Trinidad and Tobago.
  - Closing price availability time change of Israel market
- **Appendix VIII: Country Composition of MSCI Regional Indices**
    - Updates for Pakistan

## 2009

### February:

- **Section 2: MSCI Daily Total Return (DTR) Index Methodology**
  - **Country Exceptions**
    - Update on Russian dividends treatment (2.3.6)
  - **Taxes on Dividends**
    - Change in the wording to clarify the dividend taxes (2.3.7)
    - Addition of Australian Dividends as an exception (2.3.7.2.1)
- **Appendix VI: Withholding Tax Rates**
  - Addition of Botswana, Ghana, Jamaica and Trinidad and Tobago
  - Updates for China on B shares and H shares, Estonia, Germany, Greece, Korea, and Philippines

### March:

- **Appendix VI: Withholding Tax Rates**
  - Updates for Kazakhstan and Lithuania

### April:

- **Appendix VII: Closing Prices Policy**
  - Update close price definition and description of Trinidad and Tobago

### May:

- **Section 1: MSCI Price Index Methodology**
  - Reordering of chapters
  - Addition of example of index calculation using contribution method
  - Addition of chapter 'Note on Index Calculation in Local Currency'
  - Addition of chapter 'Conversion of indices into Another Currency'
- **Section 2: MSCI Daily Total Return (DTR) Index Methodology**

- 2.2.3 dividends resulting in a reinvestment only
  - Change in paragraph related to optional dividend
- **Appendix V: Singapore and Singapore Free Indices**
  - Section added. Information was previously part of Frequently Asked Questions Appendix
- **Appendix VI: Withholding Tax Rates**
  - Updates for China Red Chip and Kuwait
- **Appendix VII: Closing Prices Policy**
  - Closing price used for Jamaica updated to be Average Price
  - Closing price used for Pakistan updated to be Official Close
  - Additional closing price used for Kazakhstan updated to be closing price of Kazakhstan (UK listed Depository Receipts) and following UK closing price policy.
- **Appendix VIII: Country composition of MSCI Regional Indices**
  - Update for Argentina
  - Update for Pakistan
  - Update for Trinidad and Tobago
- **Frequently Asked Questions**
  - Section removed: Removal of information related to Israel Domestic and Israel Non-Domestic
  - Information related to Singapore and Singapore Free Indices moved to Appendix V.

## July:

- **Appendix VII: Closing Prices Policy**
  - Closing price used for UAE, International Financial Exchange, updated to be Official Close Price
  - Closing price used for Czech Republic updated to be Official Close Price.
  - Update closing prices availability for the Belgium, Netherlands, France and Portugal.
  - Update close price definition and description of USA (NASDAQ Global Market, NASDAQ Global Select Market)
  - Additional column of market identifier code (MIC) is added.
  - Closing price description update of ADR from Argentina, Colombia, Israel and Peru.
  - Bloomberg country codes for the following countries have been updated. (Argentina, Brazil, Canada, Chile, Columbia, Czech Republic, Egypt, Kazakhstan (UK listed Depository Receipts), Korea, Pakistan, Russia (UK listed Depository Receipts), Spain, UAE, USA, Vietnam)

## September:

- **Appendix VII: Closing Prices Policy**
  - MIC update for Oslo Stock Exchange and Taiwan Stock Exchange.

## November:

- **MSCI Equity Indices**
  - Addition of CNY as a currency indices are provided in.
- **Section I and section II**
  - Addition of note for China A indices related to the use of the Index Inclusion Factor
- **Section II**
  - Net Daily Today Return
    - Updates for Net Daily Total Return (2.2)

- Withholding Tax
  - Country of incorporation is used to determine the relevant dividend withholding tax rate (2.3.7.2)
- **Section III: Alternative Index Calculation**
  - Section renamed Gross Domestic Product (GDP) Weighted Indices
  - Removal of Daily Hedged Indices chapter
- **Appendix I: MSCI GCC Country Indices: Saturday/Sunday Index Calculation**
  - Removal of the note related to the use of Index Inclusion Factor which is not relevant for GCC Countries.
- **Appendix III: Exchange Rates**
  - Details added related to treatment in special circumstances and if WM/Reuters does not provide rates.
- **Appendix VI: Withholding Tax Rates**
  - Updates for withholding tax rates based upon country of incorporation

## 2010

### January:

- **Appendix VI: Withholding Tax Rates**
  - Updates for Lithuania and Spain

### February:

- **MSCI Equity Indices**
  - Addition of BRL, HKD, INR, RUB and SGD as currencies indices are provided in
  - Addition of a note related to the treatment of index ruptures
- **Appendix VII: Closing Prices Policy**
  - Update for the change of closing price for Saudi Arabia
- **Appendix VIII: Country Composition of MSCI Selected Regional Indices**
  - Addition of Bangladesh
  - Changes for Israel to reflect its move from EM to DM coverage

### May:

- **Section 2: MSCI Daily Total Return (DTR) Index Methodology**
  - **2.3.3 Correction**
    - Addition of precision in correction implementation timing
  - **2.3.6 Country Exceptions**
    - Addition of precision on timing for implementation of late dividends (2.3.6)
    - Addition of precision on Korean and Russian late dividends (2.3.6)
- **Appendix I: Saturday/Sunday Index Calculation**
  - Addition of precision on corporate Events treatment
- **Appendix VII: Closing Prices Policy**
  - Removal of pricing information for Israel non Domestic
  - Closing price used for Pakistan updated to be Official Close
- **Appendix VIII: Country Composition of MSCI Selected Regional Indices**

- Changes for Bangladesh to reflect its inclusion into the FM regional index.
- **Appendix IX: Real Time Indices**

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